United States Air Force

Soil Vapor Extraction at the Jet Engine Buildup Shop



Loring Air Force Base

STARTUP REPORT

DRAFT

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May 1999

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STARTUP REPORT

DRAFT

Prepared for:
Department of the Air Force
Air Force Center for Environmental Excellence (AFCEE)
Brooks Air Force Base, Texas 78235-5328

Prepared by:
Bechtel Environmental, Inc.
151 Lafayette Drive
Oak Ridge, Tennessee 37830

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Prepared Jeff N. Sins for Eric Berglund	5/18/99
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Bechtel Project Engineer	Date Date
Approved Bechtel Project Manager	5//6/99 Date

CONTENTS

	Page
FIGURES	iii
TABLES	iii
ACRONYMS AND INITIALISMS	
UNITS OF MEASURE	
1.0 INTRODUCTION	
2.0 SITE BACKGROUND	
2.1 SITE DESCRIPTION AND BACKGROUND	
2.2 NATURE AND EXTENT OF CONTAMINATION	4
2.3 REGULATORY SETTING	4
2.4 CLEANUP CRITERIA	4
3.0 CHRONOLOGY OF EVENTS	4
4.0 SOIL SAMPLING	
5.0 SYSTEM INSTALLATION	
5.1 AIR EXTRACTION WELL AND MONITORING POINT INSTALLATION	9
5.2 BLOWER SYSTEM	10
5.3 EMISSIONS EQUIPMENT	10
5.4 PIPING	10
5.5 SURFACE SEAL	10
6.0 STARTUP	12
6.1 PRE-STARTUP CHECKOUT	12
6.2 PRE-STARTUP TESTING	12
6.3 BASELINE SAMPLING	12
6.4 STARTUP	12
6.4.1 Air Extraction Well Data	12
6.4.2 Monitoring Point Data	15
6.4.4 Emission Data.	15
6.4.5 Groundwater Management	19
7.0 SUMMARY	
3.0 RECOMMENDATIONS	
REFERENCES	
CLI EXCINCES	23

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ACRONYMS AND INITIALISMS

AEW air extraction well AFB Air Force Base

AFBCA Air Force Base Conversion Agency

AFCEE Air Force Center for Environmental Excellence

AIW air injection well

ARAR applicable or relevant and appropriate requirements

BEI Bechtel Environmental, Inc.

bgs below ground surface

EE/CA Engineering Evaluation/Cost Analysis
EPA U.S. Environmental Protection Agency

ES Entomology Shop
JEBS Jet Engine Buildup Shop

MP monitoring point

MDEP Maine Department of Environmental Protection

PAV passive air vent

PRG photo ionization detector preliminary remediation goal

PVC polyvinyl chloride

RAWP Removal Action Work Plan

SVE soil vapor extraction TCE trichloroethene

TVOC total volatile organic compounds

UNITS OF MEASURE

cfm cubic feet per minute

in. inch/inches
in H₂0 inches of water
in. Hg inches of mercury

ft feet

ft² square feet
gal gallon
kg kilogram
lbs pounds
μg microgram
ppm parts per million

ppmv parts per million (volume basis)

rpm revolutions per minute

scfm standard cubic feet per minute

yd³ cubic yard

1.0 INTRODUCTION

The Air Force intends to perform removal actions of contaminated surface and subsurface soil at Loring Air Force Base (AFB) in Limestone, Maine. These removal actions will comply with a Federal Facilities Agreement between Region I U.S. Environmental Protection Agency (EPA), the Maine Department of Environmental Protection (MDEP), and the U.S. Air Force signed on January 30, 1991. Bechtel Environmental, Inc. (BEI) has been contracted by the Air Force Center for Environmental Excellence (AFCEE) as the removal action contractor for Loring AFB under Prime Contract No. F41624-94-D-8072.

This startup report documents the construction and startup (first month of operation) of a Soil Vapor Extraction (SVE) system at the Jet Engine Buildup Shop (JEBS). The SVE system will provide subsurface remediation for the area contaminated with trichloroethene (TCE). The system includes blower/vacuum unit, SVE wells, monitoring points (MPs), and piping.

2.0 SITE BACKGROUND

2.1 SITE DESCRIPTION AND BACKGROUND

Loring AFB is located in Aroostook County in the northeastern corner of Maine about 3 miles from the Canadian border (see Figure 2-1). The base occupies about 9,000 acres near the town of Limestone, Maine. The base was constructed between 1946 and 1953, and improvements were made throughout its operational life. Most recently, the base was part of the Air Combat Command. On September 30, 1994, Loring AFB was officially closed and is now the responsibility of the Air Force Base Conversion Agency (AFBCA). The JEBS site is located west of the flightline in the south-central industrial area of the Base (Figure 2-2).

The geology of the Loring site consists of overburden soils containing glacial till and reworked glacial till that have been used as fill materials. The thickness of the soils is variable between the different operable units but is generally between 10 and 30 ft thick. Bedrock at the site is a well-cemented, highly fractured, weathered limestone of the Carys Mills Formation that generally dips to the west (URS 1995).

Groundwater at the JEBS is present in both the overburden and the bedrock. Groundwater in the overburden is generally unconfined, discontinuous, and often perched. The depth to groundwater in the overburden is generally about 10 to 20 ft below ground surface (bgs). Groundwater flow direction within the overburden appears to be predominantly to the south-southwest. Groundwater in the bedrock primarily occurs in the secondary porosity features such as fractures and bedding planes. Groundwater in the bedrock aquifer is under unconfined to semiconfined conditions and groundwater flow is controlled by fracture orientation, which primarily trends northeast and northwest. Vertical flow in the bedrock aquifer is generally upward (URS 1995).

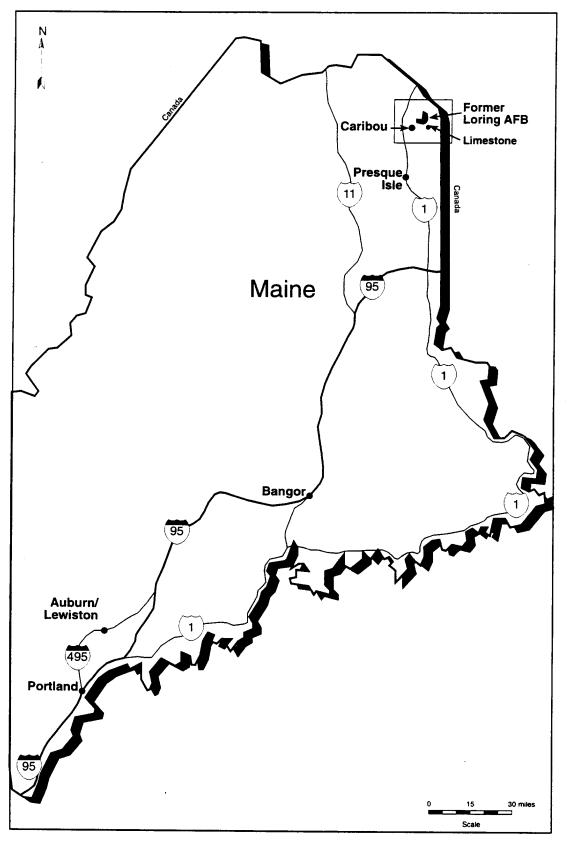


Figure 2-1 Loring Air Force Base Location Map

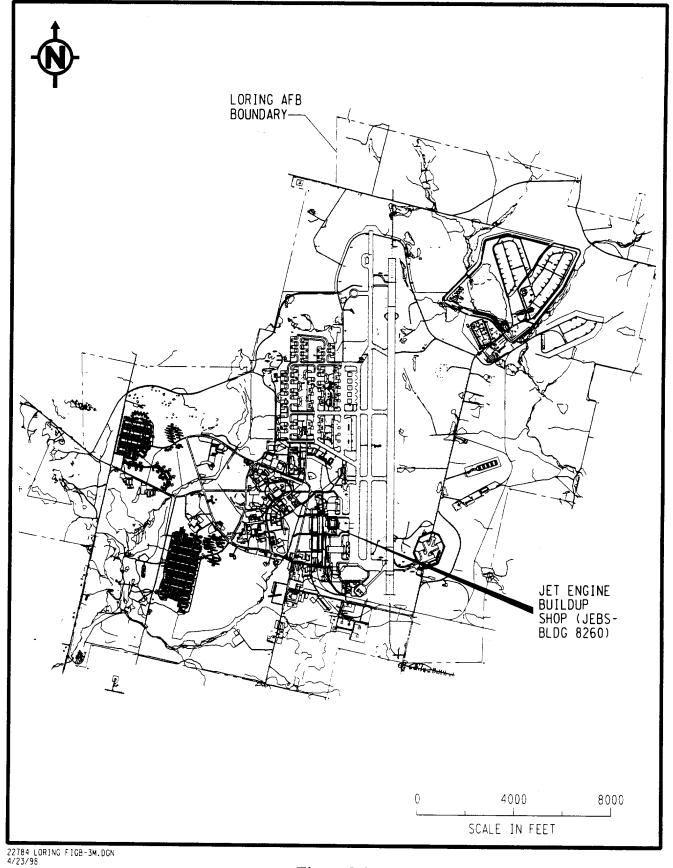


Figure 2-2 Loring Air Force Base

2.2 NATURE AND EXTENT OF CONTAMINATION

TCE has been detected at the JEBS site at concentrations that may impact groundwater to levels above regulatory criteria [Engineering Evaluation/Cost Analysis (EE/CA) for JEBS and Building 8710, Bechtel 1998a]. As the primary contaminant of concern, TCE defines the limits of the removal action. TCE concentrations at the North, South and Southeast JEBS areas are shown on Figure 2-3. The volume of soil to be remediated was calculated in the EE/CA to be 49,665 yd³ and the amount of TCE in that soil was calculated using arithmetic means of soil TCE concentrations to be 819 lbs.

2.3 REGULATORY SETTING

The removal actions being performed at Loring AFB are authorized under the Comprehensive Environmental Response, Compensation, and Liability Act, Section 104. The removal action design is based on the EE/CA. The EE/CA presents a complete discussion of applicable or relevant and appropriate requirements (ARARs) for this removal action. These ARARs were incorporated into the design and planning of the JEBS site action.

2.4 CLEANUP CRITERIA

The EE/CA presented broad removal action objectives that would prevent leachate generated from soil contaminated in excess of the preliminary remediation goal (PRGs) from migrating to groundwater at concentrations greater than ARARs. Specific performance objectives presented in the EE/CA are as follows:

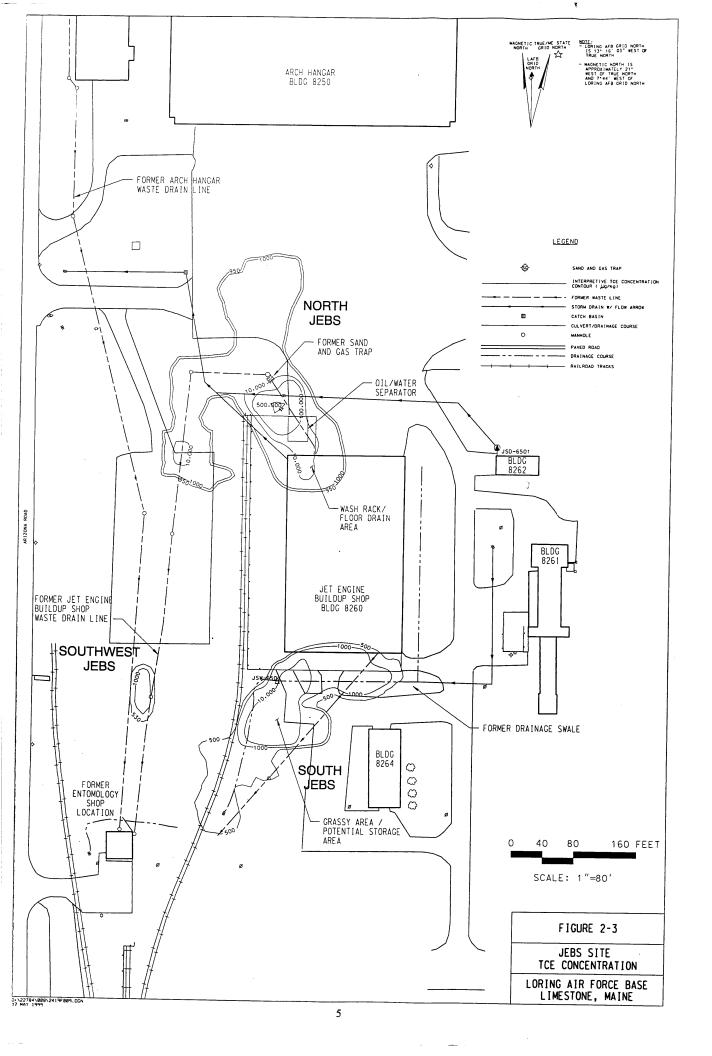
Treat contaminated soil for TCE using an in situ SVE process to an action level of:

- 950 μg/kg at the North JEBS area
- 500 μg/kg at the South JEBS area
- 530 μg/kg at the Southwest JEBS area

3.0 CHRONOLOGY OF EVENTS

The following presents the chronology of events involved in the construction and startup of the JEBS SVE system:

DATE	EVENT
8/27/98	Geoprobe sampling to delineate extent of contamination
8/31-9/14/98	Construct air extraction and passive wells and MPs



DATE	EVENT
9/4/98	Geoprobe sampling to delineate extent of contamination inside south end of JEBS building
9/26-27/98	Construct well head and service loop manifolds
9/27-10/22/98	Construct piping to connect SVE wells
10/19/98	SVE equipment inspection at subcontractors plant (Appendix C)
10/22/98	Move biovent equipment from Entomology Shop (ES) biovent building to Nose Dock 28 for storage and convert building to JEBS SVE system service building
10/26/98	Process equipment delivered and installed in service building
10/27/98	Hook well head piping to system blower
10/27/98	Electrical hookup of system
10/30/98	Obtain background data total volatile organic compounds (TVOC) from air extraction wells (AEWs)
11/2/98	System startup begins (30 day startup period)
12/2/98	Begin normal operation and maintenance period

4.0 SOIL SAMPLING.

Prior to construction, BEI was requested by the Air Force to confirm that the aerial extent of contamination had been determined and that contamination did not extend beneath the south end for the JEBS building. Geoprobe sampling was performed at 10 locations (Figure 4-1) in accordance with Soil Vapor Extraction at the Jet Engine Buildup Shop, Removal Action Work Plan, Final (Bechtel 1998b). Borehole logs and headspace results are included in Appendix A. Laboratory analysis results are presented in Table 4-1. No system design changes were indicated by the sampling results from perimeter borings PB-1 to PB-8 since no cleanup levels were exceeded. The detection limits for samples collected from perimeter borings PB-9 and PB-10 are higher than the action level in that area. Those sample locations are within the area of influence of system. No additional action is recommended at this time.

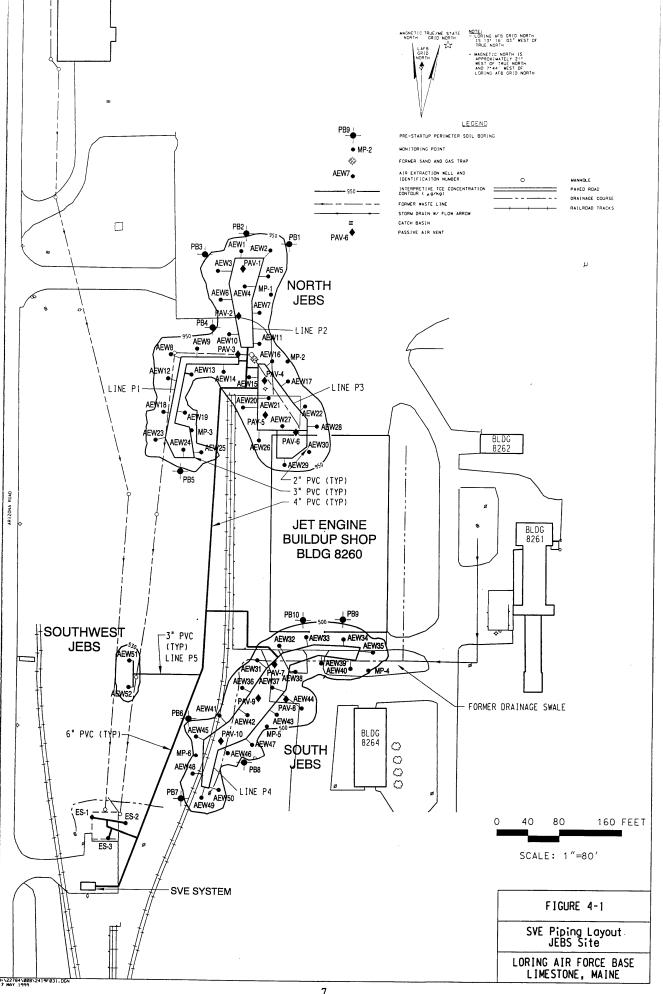


Table 4-1 JEBS Soil Sampling Analytical Results

BORING	SAMPLE DEPTH (ft)	DETECTION LIMIT ug/kg	TCE CONCENTRATION ug/kg	ACTION LEVEL ug/kg		
PB-1	16-17	220	280	950		
PB-2	18-20	190	300	950		
PB-3	16-18	190	250	950		
PB-4	16-17	220	860	950		
PB-5	14-16	220	non detect	950		
PB-6	14.5-16	200	non detect	500		
PB-7	11-12	190	non detect	500		
PB-8	12-14	160	non detect	500		
PB-9	16-16.5	920	non detect	500		
PB-10	11-12.5	950	non detect	500		

5.0 SYSTEM INSTALLATION

The SVE system consists of 55 AEWs, 10 passive air vents (PAVs), 12 MPs, piping, and blower/vacuum system. Three of the AEWs are converted biovent air injection wells (AIW) previously installed at the former ES biovent system. These were added to the SVE system to complete cleanup of TCE contamination at this site.

5.1 AIR EXTRACTION WELL AND MONITORING POINT INSTALLATION

The AEWS, PAVs, and MPs were installed by a drilling subcontractor as the initial step in construction of the SVE system. Wellhead units were assembled and installed by the BEI field staff. All activities were supervised by a BEI onsite geologist who recorded the drilling activities and subsurface information in a logbook. Boring logs and well completion reports of each AEW, PAV, and MP installed are provided in Appendix B. Well and MP locations are shown on Figure 4-1.

The AEWs were installed as specified in the Soil Vapor Extraction at the JEBS Removal Action Work Plan (Bechtel 1998b). Each well was completed, packed with sand around the screened intervals, sealed with a bentonite plug, and grouted with EZmud/Benseal. Above-grade well completion's were installed as specified in the Removal Action Work Plan (RAWP) (Bechtel 1998b).

There were a total of 52 AEWs and 10 PAVs installed over an area of approximately 67,000 ft² to depths of 11.2 to 27.0 ft bgs. Two wells were installed inside the JEBS building. Well completions were all above grade mountings, with a 2-in. polyvinyl chloride (PVC) riser and a PVC screened interval at the bottom of each well.

A total of 12 MPs were installed in 6 locations to depths of 7 to 18 ft bgs (see Table 6-3 for installed depths). All MPs were in clusters of two points at one location. The MPs were constructed of 1/4 in. PVC tubing with a 6-in. wire-wrapped stainless steel, slotted screen. Completions are all below-grade mountings.

Three ES biovent AIWs were converted to SVE wells by manifolding them into the JEBS system. These wells will be used to complete remediation of the ES site. Confirmation sampling at this site showed that a small area of TCE contamination remained (Bechtel 1998c). Because biovent AIWs were designed using a radius of influence of 32 ft and SVE wells used a radius of influence of 25 ft, the coverage of the contaminated area by the three converted wells was checked using a radius of influence of 25 ft. This preliminary evaluation indicates that there may be enough overlapping coverage to complete remediation without adding wells, however, additional flow and pressure data from this area under better operating conditions will be required to make a final judgment (high water table limited flow capacity during the start-up period). Action level at the ES is $540 \,\mu\text{g/kg}$ for TCE.

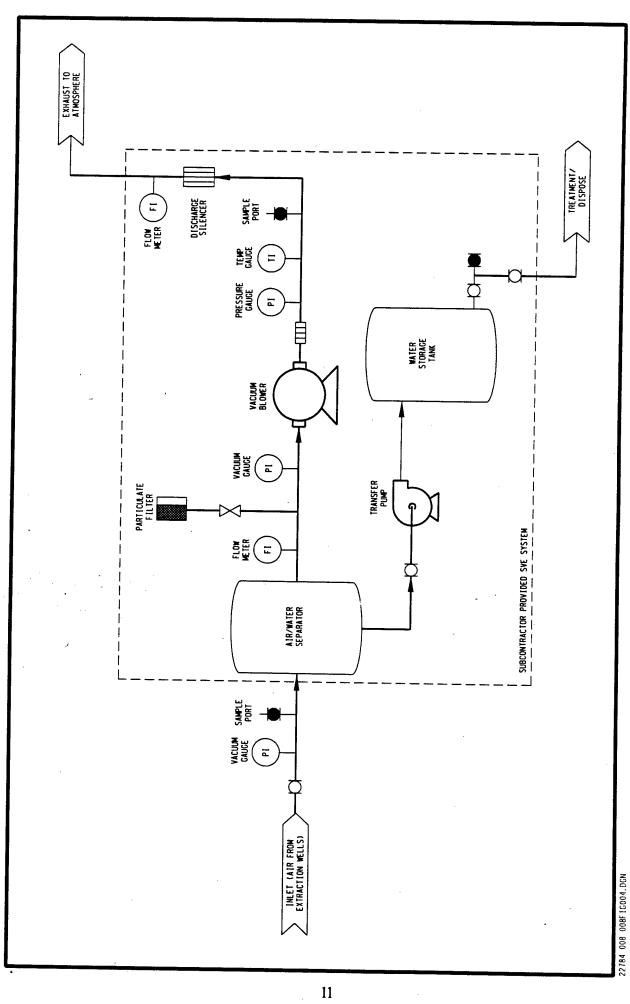


Figure 5-1
Vapor Extraction Diagram
Loring Air Force Base

6.0 STARTUP

6.1 PRE-STARTUP CHECKOUT

Before startup, a complete system check was performed to verify that the blower system was properly connected to the piping system, proper electrical connections had been made, and blowers and motors were properly lubricated.

6.2 PRE-STARTUP TESTING

Before actual operation, the blower system was started to check for air leaks and to ensure that gauges and meters worked properly, and the system delivered the proper flow and vacuum. The system and piping was checked for air leaks with the wells shut off to create maximum vacuum inside the piping.

6.3 BASELINE SAMPLING

Baseline sampling of soil gas was performed before the system was started. Soil gas was sampled at each AEW and analyzed for TVOC using field instrumentation. Each well was purged of one well volume of air before sampling. These data are presented in Table 6-1. Baseline sampling was done to provide data on prestartup soil gas contamination levels. These data will be used for comparison to future data obtained under similar static conditions (equilibrium) of the system being shut down. This will provide an indication of how cleanup is progressing.

6.4 STARTUP

Startup took place between November 2, 1998 and December 2, 1998. Startup activities were performed to assess and maximize the performance of the SVE system and to determine if emissions controls need to be implemented. The following activities were performed during the system startup period:

- Measure AEW flow rates and vacuums and adjust to meet design where possible
- Measure vacuum in the MPs
- Record blower system performance data including flow and vacuum
- Monitor and quantify vapor emissions
- Management of groundwater drawn into the system during normal operation.

6.4.1 Air Extraction Well Data

TVOC data from the AEWs was collected once during the startup period. This data is shown on Table 6-2. These data will be compared to data obtained in a similar manner while the system is running to adjust individual well flows and balance the system. Air extraction well flow and

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Table 6-2

AEW Sampling

Total Volatile Organic Compounds

WELL NUMBER	WELL DEPTH (ft from top of valve)	DEPTH TO TOP OF SCREEN (ft from top of valve)	TVOC (ppm)
		(when top or varie)	11/9/98
AEW-1	18.85	7.85	off
AEW-2	21.90	7.90	16.8
AEW-3	20.75	7.75	off
AEW-4	22.40	7.90	. 32.2
AEW-5	18.90	7.90	3.1
AEW-6	20.50	5.00	4.6
AEW-7	23.45	8.45	5.2
AEW-8	20.35	8.35	8.9
AEW-9	22.15	8.15	37.4
AEW-10	23.15	8.15	40.1
AEW-11	23.60	8.60	26.1
AEW-12	22.15	8.15	15.4
AEW-13	20.70	7.70	42.6
AEW-14 "	23.05	8.05	169
AEW-15	18.00	8.00	1.7
AEW-16	14.00	8.00	2
AEW-17	20.25	7.75	
AEW-18	17.25	8.25	19.1
AEW-19	20.00	8.00	16.9
AEW-20	22.85	7.85	33.6
AEW-21	18.90	7.90	114
AEW-22	17.65	7.65	1.2
AEW-23	18.10	7.60	2.7
AEW-24	11.15	8.15	36.1
AEW-25	15.30	8.30	73.5
AEW-26	18.00	8.00	off
AEW-27	18.70	7.70	5.6
AEW-28	18.15	7.65	9
AEW-29	18.25	8.25	1.2
AEW-30	20.60	8.60	2.4
AEW-31	21.15	7.65	10:4
AEW-32	20.85	7.85	off
AEW-33	20.35	7.85	3.1
AEW-34	18.80	7.80	41.2
AEW-35	20.35	7.85	25.2
AEW-36	18.60	7.60	61.2
AEW-37	23.45	8.45	32.5
AEW-38	22.85	8.85	92.4
AEW-39	27.00	12.00	35
AEW-40	20.70	7.70	45.1
AEW-41	19.65	7.70	36.1
AEW-42	14.85	7.69	49.1
AEW-43	24.20	9.20	21.2
AEW-44	23.00	8.50	61.6
AEW-45	18.85	7.85	3
AEW-46	19.15	8.15	off
AEW-47	23.15	8.15	17
AEW-48	19.06	8.05	3.1
AEW-49	19.10	7.60	off
AEW-50	18.35		off
AEW-51	23.75	7.85	off
AEW-52	23.40	8.75	10.2
ES-1(AIW-2)	17.45	8.40	off
ES-2(AIW-3)	17.45	12.45	off
ES-3(AIW-7)	17.45	9.90	28.3
	17.40	12.45	36.7

Table 6-3
SVE Well Flow and Vacuum Data

86/			FLOW	0		19.1	0		13.6	0	0	15.4	3.1	c	12 B	13.7	c	0	,	С		,	11.1	0	0	-	16.3	200		0		0	0		3.6	0	0
11/30/98			VACUUM	off-	water	29	- jj o	water	4.2	frozen	frozen	3.8	34	34	33	4.3	frozen	- j o	water	34	1	water	33	frozen	frozen	frozon	27	broken	frozen	-JJo	water	frozen	off-	water	27	broken	frozen
3/98			FLOW (scfm)	0		0	0		0	0	0	16.3	0	0	5.4	80	0	0		0	0		0	7.5	0	11.3	8 8		7.8	0		0	0		4.5	0	0
11/23/98			VACUUM (in H ₂ O)	off.	water	0.3	off-	water	frozen	frozen	frozen	2.3	0.7	0.69	2.2	2.3	frozen	-jjo	water	0.19	off.	water	0	0.94	frozen	20	-	broken	96.0	off-	water	0.7	-JJo	water	-	frozen	frozen
11/19/98			FLOW (scfm)	0		1.5	0		0	0	0	14.2	15.3	13.1	15.2	15.6	0	0		7.7	0		9.8	10.1	0	10.5	10.8	0	4.2	0		9	0		3.4	0	0
11/1			(in H ₂ O)	off-	water	5	off-	water	frozen	frozen	frozen	2.5	49	27	32	5	frozen	off-	water	20	off-	water	44	1.6	off- water	2	1.7	broken	0.65	-JJo	water	43	-JJo	water	1.7	frozen	frozen
11/17/98	,		FLOW (scfm)	0		13.9	0		0	0	0	13.1	5.8	13.4	13.2	10.3	0	0		3.1	0		11.5	12.6	0	10.4	12.3	0	8.8	0		25.3	0		0	٥	0
11/1			(in H ₂ O)	-JJO	water	5	off-	water	frozen	frozen	frozen	4.7	29.5	26	29	frozen	1.3	off-	water	frozen	off-	water	30	5	90	3.8	2	frozen	2.7	off-	water	frozen	off-	water	8	trozen	frozen
11/13/98		100	(scfm)	0		0	0		0	0	0	12.7	4.3	. 0	0	9.4	0	0		0	4.9		3.3	13.6	0	10.5	11.6	0	10.2	0		10.9	0	,	7:/	8.6	
11/1			(in H ₂ O)	off-	water	2	- j o	water	6.0	2.8	5	5	5	9	5	5	1.1	off-	water	9	ß		5.5	4.6	ဖ	2.5	2.6	0.02	5.5	off-	water	و	off-	water	ti Ci	C. 6	7.8
11/9/98		WC 13	(scfm)	2.9	,	9.6	0	,	9	9.6	9.5	12.1	11.5	13.9	10.4	8.8	8.9	12.3		5	11.2		13	10.6	0	12.7	11.4	8.9	11.7	9.5	į	3.5	0	200	6.2	8.6	12.4
11/		VACIDIM	(in H ₂ O)			į	 	water																		1							off-	Water			
11/6/98		ELOW	(scfm)	0	ļ	اوز	-	1	12./	11.	8.4	11.5	Ξ	12.4	11.9	12	10.9	10.3	,	3.7	10.2		3	10.1	0	9.3	9.2	10.7	5	0	,	٥	0		11.0	5 £	=
11/		VACILIM	(in H ₂ O)	Note 2		,	- <u>H</u> o	water																								,,,	off- water	2			
DEPTH TO	SCREEN	(It Irom tov I)		7.85	7.00	7.30	6/:/	4	7.30	08.7	5.00	8.45	8.35	8.15	8.15	8.60	8.15	7.70	1000	8.05	8.00		8.00	67.7	6.23	8.00	7.85	7.90	7.65	7.60	0 15	0.13	8.30	00 8	2 70	7.65	30.
WELL	(ft from	(. ^0)		18.85	24.00	20.30	50.02	22.40	48.00	10.90	20.50	23.45	20.35	22.15	23.15	23.60	22.15	20.70	1000	23.05	18.00	30,7	14.00	27.72	C7: / l	20.00	22.85	18.90	17.65	18.10	14.46	2	15.30	18.00	18 70	18 15	2.52
WELL				AEW-1	AEM 2	AEW-2	YEAR-3	A EN A	ACV +	AEW-5	AEW-0	AEW-/	AEW-8	AEW-9	AEW-10	AEW-11	AEW-12	AEW-13	A 1715 4 4	AEW-14	AEW-15	A C14/ 40	AEW-16	ACW-1/	AEW-10	AEW-19	AEW-20	AEW-21	AEW-22	AEW-23	AEW 24	AEW-24	AEW-23	AFW.26	AFW-27	AFW-28	7-11-

16

Table 6-4
Monitoring Point Data

Monitoring Point Number	Depth to Bottom of Screen (ft)		euum f H ₂ 0)			
		<u>11-13-98</u>	12-1-98			
MP-1-7	7	.08	0			
MP-1-17	17	.82	.66			
MP-2-7	7	.91	0			
MP-2-10	10	.90	.90			
MP-3-7	7	.90	.90			
MP-3-16	16	.61	.58			
MP-4-7	7	0	0			
MP-4-16	16	.90	.84			
MP-5-7	7	.09	0			
MP-5-18	18	1.00	.82			
MP-6-7	7	0	0			
MP-6-13	13	4.60	4.30			

Table 6-5 System Flow

Date	Total Influent Flow (scfm) ¹	Total Effluent Flow (scfm) ²				
11-6-98	362	860				
11-7-98	360	860				
11-9-98	360	860				
11-18-98	. 282	860				
11-25-98	101	860				
11-30-98	215	860				
12-2-98	215	860				

¹ Total flow calculated from individual well measurements.

² Flow = velocity × cross-section area. Velocity measured with a hot wire anemometer.

Table 6-6 Emissions Data

		1	2	3	4	5	6	7	8
	Number of Air Extraction Well In	Effluent Level PID -	Effluent TCE Concentration -	System Effluent	Effluent Temperature,	Effluent	Non-ideal volume @ temp. and	mg_TCE /m3 per	TCE Emission.
Date Sampled	Operation	ppmv	ppmv	Flow, acfm	C C	Pressure, atm	pressure	ppmv	lbs/day
11/9/1998	39	15	33	860	60	1.01	27	5.61	14.28
11/13/1998	25	40	96	860	60	1.01	27	5.61	41.55
11/25/1998	14	6.5	37	860	60	1.01	27	5.61	16.02
12/2/1998	17	5.3	15	860	60	1.01	27	5.61	6.49

Notes

Column 1: vapor volatile organic concentration measured at SVE blower discharge by photoionization detector (PID) in parts per million on a volume basis (ppmv)

Column 2: vapor volatile organic concentration measured at SVE blower discharge

by analytical laboratory in parts per million on a volume basis (ppmv)

Column 3: SVE effluent flow - measured by hot wire anemometer

Column 3: SVE effluent flow - measured by hot wire anemomer Column 4: SVE effluent flow temperature in degrees C

Column 5: SVE effluent pressure in psi

Column 6: molar volume of gas, calculated as follows:

Molecular weight of $TCE = 151.5 \times 10^{3}$

$$v = \frac{nRT}{p}$$

where

v = liters of gas per mole @ temperature and pressure

n = number of moles

T = temperature, degrees K

p = pressure, atm

R =0.0821 L-atm/mol-K

Column 7: Conversion factor for ppmv to mg/m3 as follows:

$$\frac{1ppmv}{TCE} = \frac{1moleTCE}{10^6 moleair@333K;1.01atm} = \frac{151.5x10^3TCE}{10^6 (Column 6x10^{-3})}$$

Column 8: pounds per day TCE emitted calculated as follows:

$$\frac{lbs}{day} = Column_3 \left(\frac{ft^3}{min}\right) \times Column_2 \left(\frac{mm}{2}\right) \times \frac{m^3}{35.31ft^3} \times Column_3 \left(\frac{mg}{m^3}\right) \times \frac{kg}{10^6 mg} \times 2.2 \frac{lbs}{kg} \times 1440 \frac{min}{day}$$

Example Calculation (for 11/9/98 data):

1. Molar volume:

$$v = \frac{1 \mod (0.0821)(333K)}{1.01 \mod m}$$

v = 27 L

2. Convert ppmv to mg/m3:

$$\frac{1_ppmv}{TCE} = \frac{151.5x10^3}{10^6(27x10^{-3}m^3)}$$

1 ppmv = 5.61 mg-TCE/m3

3. Calculate TCE emissions, lbs/day:

$$\frac{lbs}{day} = 860 \left(\frac{ft^3}{\min}\right) x33 (ppmv) x \frac{m^3}{35.31 ft^3} x5.61 \left(\frac{mg}{m^3} per - ppmv\right) x \left(\frac{kg}{10^6 mg}\right) x2.2 \frac{lbs}{kg} x1440 \frac{\min}{day}$$

lbs/day = 14.28

8.0 RECOMMENDATIONS

- 1. If the number of wells allowing flow remains at a low level, shut the system down for the rest of the winter months and restart in the spring.
- 2. When more wells become operational (in the spring), monitor groundwater levels on a more frequent basis to determine if the perched zones can be dried out and maintained relatively dry by the SVE system.
- 3. Continuing evaluation of the system operation during normal operations.
- 4. Evaluate the need for a full or partial surface seal during the summer of 1999.
- 5. Evaluate effluent sampling methods to assure accurate determination of effluent rates and prediction of cleanup times

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- Buscheck, T.E. and T.R. Peargin, 1991. Summary of a Nation-Wide Extraction System Performance Study. In Proceedings of the 1991 Petroleum Hydrocarbons and Organic Chemicals in Ground Water Prevention, Detection, and Restoration.
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APPENDIX A

PRESTARTUP PERIMETER SOIL BORINGS BOREHOLE LOGS AND HEADSPACE SCREENING

Projec	et Name: Loring AFB	T			Borehole No.: PBH-1			
	et Number: 22784	Eleva	tion:	TBD				
Locati	on: JEBS	Date Started:8/27/98 Date Completed: 8/27/98						
Driller	: Patrick St. Peter and Sons	Total Depth (ft): 17						
Equip	ment: Geoprobe		to Bedro					
Drilling	g Method: Drive/Hammer		Diameter		3			
	g Fluid: None		to Water	<u> </u>	7			
Comp	letion: Completed as Perimeter Borehole				Geo-probe Macro-sampler			
	,	Loggo	а <i>Б</i> у. Т.	Lilley	is 4ft in length			
					is in ionga,			
£	_		Sample Type	Reading				
) E	Description	를 등	<u>e</u>	چ چ	Comments			
Depth (ft)	·	Sample Number	amp	Hun				
	0-0.33ft: Asphalt	1	Macro-	0	0-2ft: Refusal with geo-			
_	0.33-4ft: Fill - Sandy Gravel: (GM), White (N9)		sampler		probe sampler, relocate			
_	to dk gry (N3), fine to v coarse, unconsid, poorly		1	ļ	approx. 2ft west.			
<u> </u>	sorted, subang to subrd.		1		0-2ft: Refusal with geo-			
5_	4-7ft: Fill - Sandy Gravel: (GM), As above.	2	Macro-	0	probe sampler, relocate			
-	"		sampler		approx. 2ft east of original			
_	7-8ft: Gravelly Silty Clay: (CL), Mod yel brn			l	location.			
	(10YR5/4) to mod brn (5YR3/4), V fine to fine,		1					
	unconsid, poorly sorted, subang to subrd, wet.							
10_	8-10.5ft: Gravelly Silty Clay: (CL), As above.	3	Macro-	0	Refusal at 10.5ft - no bdrk,			
_	10.5-12ft: Gravelly Silty Clay: (CL), As above.	4	sampler	0	relocate approx. 1ft north			
-	12-13ft: Gravelly Silty Clay: (CL), As above.	5	Macro-	0	of borehole location.			
_	13-13.5ft: Gravell lens.	-	sampler					
1 45-	13.5-14ft: Gravelly Clayey Silt: (ML), Mod yel		}					
15_	brn (10YR5/4) to Pale yel brn (10YR6/2), V fine to							
	fine, semi-consld, poorly sorted, subang to subrd,							
-	moist.			`*				
-	14-16ft: Gravelly Silty Clay: (CL), Mod yel brn	6	Macro-	0				
]	(10YR5/4), V fine to fine, unconsid, poorly sorted,		sampler '					
	subang to subrd.		1					
	16-17ft: Gravelly Silty Clay: (CL), As above,	7	Macro-	0	Sample collected for off-			
	gravel fraction increase to 30%.		sampler		site Laboratory analysis.			
-					sample number:LO19123			
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Proie	ct Name: Loring AFB	Т								
	ct Number: 22784	Borehole No.: AEW-12 Elevation: TBD								
	tion: JEBS	Date Started:8/31/98 Date Completed: 8/31,								
	r: Great Works Drilling	Date S	tartea:8	/31/98						
	oment: Mobile B59	Total L	19							
	g Method: Hollow Stem Auger	Depth	to Bedro	ock (ft)						
	g Fluid: None		iameter		8					
	Detion: Completed as a Soil Vapor Extraction Well		to Water		TBD					
	See Construction Log for details	Logged	d By: P.	Linley						
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments					
	0-19ft: Gravelly Clayey Silt : (<i>ML</i>), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, gvl 5-6 inches in diameter. 8ft: Moist. 15-16ft: Cobble zone.				No samples required to be collected during installation					

Projec	t Name: Loring AFB				Borehole No.: PBH-3
Projec	t Number: 22784	Elevat	ion:	TBD	
Location	on: JEBS	Date S	started:8	27/98	Date Completed: 8/27/98
Driller:	Patrick St. Peter and Sons		Pepth (ft)		20
	ment: Geoprobe	Depth	to Bedro	ck (ft).	20
Drilling	Method: Drive/Hammer		iameter		2
	r Fluid: None		to Water	<u> </u>	7.5
Compl	etion: Completed as Perimeter Borehole		d By: P.		
Depth (ft)	Description	Sample Number	Sample Type	Hnu Reading	Comments
] _	0-0.33ft: Asphalt	1	Macro-	0	The Geo-probe Macro-
5	0.33-4ft: Fill - Sandy Gravel: (GM), White (N9) to dk gry (N3), fine to v coarse, unconsid, poorly sorted, subang to subrd. 4-7.5ft: Fill - Sandy Gravel: (GM), As above.	2	sampler Macro- sampler	0	sampler is 4ft in length.
	7.5-8ft: Gravelly Clayey Silt: (<i>ML</i>), Olive gry (5Y4/1) to mod yel brn (10YR5/4), v fine to fine, unconsld, poorly sorted, subang to subrd, moist. 8-12ft: Gravelly Clayey Silt: (<i>ML</i>), As above, moist. 12-16ft: Gravelly Clayey Silt: (<i>ML</i>), As above, at 15ft - gravel lense 8 inches thick, moist.	3	Macro- sampler Macro- sampler	0	
\exists	16-18ft: Gravelly Clayey Silt: (ML), As above, moist. 18-20ft: Gravelly Clayey Silt: (ML), As above, moist.	5 6	Macro- sampler Macro- sampler	-	Sample collected for off- site laboratory analysis Sample number:LO19124
25					

Projec	t Name: Loring AFB	1			Borehole No.: PBH-4
Projec	t Number: 22784	Elevat	ion:	TBD	
Location	on: JEBS	Date S	Started: 8,	/27/98	Date Completed: 8/27/98
Driller:	Patrick St. Peter and Sons		Depth (ft)		17.5
Equipr	ment: Geoprobe	Depth	to Bedro	ck (ft).	17.5
Drilling	n Method: Drive/Hammer	Hole D	iameter	(in):	2
	g Fluid: None	Depth	to Water	(ft):	8
Compl	etion: Completed as Perimeter Borehole	Logge	d By: P.	Linley	
) de	l ig	
€	Decement in a		Sample Type	Reading	_
E	Description		Be	&	Comments
Depth (ft)		Sample Number	au	Hu	
 	0-4ft: Gravelly Clayey Silt: (ML), Dk yel org	<u> </u>			The Constraint Manager
_	(10YR6/6) to dk yel brn (10YR4/2), v fine to fine,	-	Macro-	0	The Geo-probe Macro-
-	unconsid, poorly sorted, subang to subrd.	-	sampler		sampler is 4ft in length.
<u>-</u>	4-8ft: Gravelly Clayey Silt: (ML), Mod brn	2			
5	(5YR4/4-3/4) to olive gry (5Y4/1), As above, gvl	~	Macro-	0	
_	to 2 inches in dia., gvl frac 15-20%.	4	sampler		
_			ļ		i
_	8-10ft: Gravelly Clayey Silt: (ML), Olive gry	3		0	
-	(5Y4/1) to It olive gry (5Y6/1), As above, moist.	1 3	Macro-	"	
10	10-12ft: Gravelly Clayey Silt: (ML), As above,	4	sampler Macro-	0	
_	10.5-11.5ft - gravel lense., moist.	~	sampler		
-	12-14ft: Gravelly Clayey Silt: (ML), As above,	5	Macro-	0	
	moist.	ľ	sampler		
	14-15.8ft: Gravelly Clayey Silt: (ML), As above,	6	Macro-	0	İ
15	moist.		sampler		
	15.8-16ft: Gravelly Silty Clay: (CL), Olive gry	1			
	(5Y4/1) to It olive gry (5Y6/1), v fine to fine, poorly	1			
	sorted, unconsid, subang to subrd, moist.				
	16-17.5ft: Gravelly Clayey Silt: (ML), Lt olive	7	Macro-	0	Sample collected for off-
20	gry (5Y6/1) to olive gry (5Y4/1), v fine to fine,		sampler		site laboratory analysis.
	unconsid, poorly sorted, subang to subrd, moist.				Sample number:LO19117
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Projec	t Name: Loring AFB				Borehole No.: PBH-5
Projec	t Number: 22784	Elevation	on:	TBD	
Location	on: JEBS	Date S	tarted:8/	27/98	Date Completed: 8/27/98
Driller:	Patrick St. Peter and Sons	Total D	epth (ft).	•	16
Equipr	ment: Geoprobe	Depth t	o Bedro	ck (ft):	16
Drilling	Method: Drive/Hammer	Hole Di	iameter	(in):	2
	Fluid: None		o Water		5
Compl	letion: Completed as Perimeter Borehole	Logged	i By: P.	Linley	
Depth (ft)	Description	Sample Number	Sample Type	Hnu Reading	Comments
_	0-4ft: Gravelly Clayey Sandy Silt: (ML), Olive	1	Macro-	0	The Geo-probe Macro-
10	gry (5Y4/1) to it olive gry (5Y6/1), v fine to coarse, unconsid, poorly sorted, subang to subrd, moist, gvl frac 35+% and up to 2 inches in diameter. 4-8ft: Gravelly Clayey Silt: (ML), Lt brn (5YR5/6) to olive gry (5Y4/1) to it olive gry (5Y6/1), v fine to fine, unconsid, poorly sorted, subang to subrd, wet at 5ft. 8-10ft: Gravelly Clayey Silt: (ML), As above, moist. 10-12ft: Gravelly Clayey Silt: (ML), As above, moist. 12-14ft: Gravelly Clayey Silt: (ML), As above, at 13.5-14ft gvl lense, v moist. 14-16ft: Gravelly Clayey Silt: (ML), As above, moist.	2 3 4 5 6	Macro- sampler Macro- sampler Macro- sampler Macro- sampler Macro- sampler		Sampler is 4ft in length. Sample collected for offsite laboratory analysis. Sample number:LO19116
25 30					

Projec	t Name: Loring AFB				Borehole No.: PBH-6
Projec	t Number: 22784	Elevati	on:	TBD	
Location	on: JEBS	Date S	tarted:8/	27/98	Date Completed: 8/27/98
Driller:	Patrick St. Peter and Sons		epth (ft)		16
Equipr	ment: Geoprobe	Depth	to Bedro	ck (ft):	16
Drilling	Method: Drive/Hammer	Hole D	iameter	(in):	2
Drilling	r Fluid: None	Depth	to Water	(ft):	6
Compl	etion: Completed as Perimeter Borehole	Logged	By: P.	Linley	
			1 2		
			d X	Reading	
€	Description	0 5	 	eac	Comments
\f	B c c c i p i c i	[호 호	į	ă.	Comments
Depth (ft)		Sample Number	Sample Type	토	
	0-4ft: Gravelly Clayey Silt: (ML), Dk yel org	1	Macro-	0	The Geo-probe Macro-
	(10YR6/6) to mod yel brn (10YR5/4) to it olive gry	1	sampler		sampler is 4ft in length.
	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid		<u> </u>		
	poorly sorted, subang to subrd, moist.				
5	4-8ft: Gravelly Clayey Silt: (ML), Lt olive gry	2	Macro-	0	
_	(5Y6/1) to olive gry (5Y4/1), as above, moist.		sampler		
	_		'		
	8-10ft: Gravelly Clayey Silt: (ML), As above,	3	Macro-	0	
	moist.		sampler		
10	10-12ft: Gravelly Clayey Silt: (ML), As above,	4	Macro-	0	
	moist.		sampler		
	12-14.5ft: Gravelly Clayey Silt: (ML), As above,	5	Macro-	0	
	moist.		sampler		
	14.5-16ft: Gravelly Silty Clay: (CL), Olive gry				Sample collected for off-
15_	(5Y4/1) to med gry (N5), v fine to fine, unconsid,				site laboratory analysis.
	poorly sorted, subang to subrd, moist.				Sample number:LO19115
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Project Number: 22784 Elevation: TBD Date Started.8/27/98 Date Completed: 8/27/98 Date	Projec	t Name: Loring AFB				Borehole No.: PBH-7
Driller Patrick St. Peter and Sons Total Depth (ft): 12	Projec	t Number: 22784	Elevat	ion:	TBD	1
Driller: Patrick St. Peter and Sons Depth to Bedrock (ft): TBD	Location	on: JEBS	Date S	Started:8	/27/98	Date Completed: 8/27/98
Drilling Method: Drive/Hammer						
Depth to Water (ft): 4 Completion: Completed as Perimeter Borehole Logged By: P. Linley Borehole flooded with muck - unable to reach bedrock.			Depth	to Bedro	ock (ft)	: TBD
Description Logged By: P. Linley Borehole flooded with muck - unable to reach bedrock.			Hole D	iameter	(in):	2
Description Descr			Depth	to Water	r (ft):	
Description O-4ft: Gravelly Clayey Sandy Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to med coarse, unconsid, poorly sorted, subang to subrd, moist to wet - lower 4 inches. 4-8ft: Gravelly Clayey Silt: (ML), Olive gry (5Y4/1) to lt olive gry (5Y6/1), v fine to fine, unconsid, poorly sorted, subang to subrd, wet. 8-9.5ft: Gravelly Silty Clay: (CL), Olive gry (5Y4/1) to lt olive gry (5Y6/1), v fine to fine, unconsid, poorly sorted, subang to subrd, wet to saturated. 9.5-12ft: Gravelly Silty Clay: (CL), As above, wet/saturated. 15 16 17 18 19 10 10 11 11 12 12 13 14 15 15 15 16 17 18 18 19 19 10 10 11 11 12 13 14 15 15 15 16 17 18 18 19 19 19 10 10 11 11 12 13 14 15 15 15 16 17 18 19 19 19 10 11 12 11 12 13 14 15 15 15 16 17 18 18 19 19 19 10 11 12 13 14 15 15 15 16 17 17 18 18 19 19 19 10 10 11 11 12 12 13 14 15 15 15 15 16 17 17 18 18 18 19 19 19 10 11 11 12 12 13 14 15 15 15 16 17 17 18 18 18 19 19 19 10 11 11 12 12 13 14 15 15 15 16 17 17 18 18 18 19 19 19 10 10 11 11 11 12 12 13 14 15 15 15 16 17 17 18 18 18 19 19 19 10 11 11 12 12 13 14 15 15 15 16 17 17 18 18 18 18 18 18 18 18	Compl	etion: Completed as Perimeter Borehole	Logge	d By: P.	Linley	Borehole flooded with
Description Descr						muck - unable to reach
0-4ft: Gravelly Clayey Sandy Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to med coarse, unconsid, poorly sorted, subang to subrd, moist to wet - lower 4 inches. 5 4-8ft: Gravelly Clayey Silt: (ML), Olive gry (5Y4/1) to It olive gry (5Y6/1), v fine to fine, unconsid, poorly sorted, subang to subrd, wet 8-9-5ft: Gravelly Silty Clay: (CL), Olive gry (5Y4/1) to It olive gry (5Y6/1), v fine to fine, unconsid, poorly sorted, subang to subrd, wet to saturated. 9.5-12ft: Gravelly Silty Clay: (CL), As above, wet/saturated. 15 4 Macrosampler Macrosa	<u> </u>					bedrock.
0-4ft: Gravelly Clayey Sandy Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to med coarse, unconsid, poorly sorted, subang to subrd, moist to wet - lower 4 inches. 5 4-8ft: Gravelly Clayey Silt: (ML), Olive gry (5Y4/1) to It olive gry (5Y6/1), v fine to fine, unconsid, poorly sorted, subang to subrd, wet 8-9-5ft: Gravelly Silty Clay: (CL), Olive gry (5Y4/1) to It olive gry (5Y6/1), v fine to fine, unconsid, poorly sorted, subang to subrd, wet to saturated. 9.5-12ft: Gravelly Silty Clay: (CL), As above, wet/saturated. 15 4 Macrosampler Macrosa	(£)	Description	o h	е Туре	eading	Comments
gry (5Y6/1) to olive gry (5Y4/1), v fine to med coarse, unconsid, poorly sorted, subang to subrd, moist to wet - lower 4 inches. 4-8ft: Gravelly Clayey Silt: (ML), Olive gry (5Y4/1) to it olive gry (5Y6/1), v fine to fine, unconsid, poorly sorted, subang to subrd, wet. 8-9.5ft: Gravelly Silty Clay: (CL), Olive gry (5Y4/1) to it olive gry (5Y6/1), v fine to fine, unconsid, poorly sorted, subang to subrd, wet to saturated. 9.5-12ft: Gravelly Silty Clay: (CL), As above, wet/saturated. 15 20 3 Macrosampler 4 Macrosampler 5 Sample collected for offsite laboratory analysis. Sample number:LO19114	Depth			-	Hnu R	
coarse, unconsld, poorly sorted, subang to subrd, moist to wet - lower 4 inches. 4-8ft: Gravelly Clayey Silt: (ML), Olive gry (5Y4/1) to it olive gry (5Y6/1), v fine to fine, unconsld, poorly sorted, subang to subrd, wet. 8-9.5ft: Gravelly Silty Clay: (CL), Olive gry (5Y4/1) to it olive gry (5Y6/1), v fine to fine, unconsld, poorly sorted, subang to subrd, wet to saturated. 9.5-12ft: Gravelly Silty Clay: (CL), As above, wet/saturated. 20 Macro-sampler 4 Macro-sampler 5 Macro-sampler 6 Sample collected for off-site laboratory analysis. Sample number: LO19114	-		1	Macro-	0	
4-8ft: Gravelly Clayey Silt: (ML), Olive gry (5Y4/1) to it olive gry (5Y6/1), v fine to fine, unconsid, poorly sorted, subang to subrd, wet. 8-9.5ft: Gravelly Silty Clay: (CL), Olive gry (5Y4/1) to it olive gry (5Y6/1), v fine to fine, unconsid, poorly sorted, subang to subrd, wet to saturated. 9.5-12ft: Gravelly Silty Clay: (CL), As above, wet/saturated. 15 2 Macro- sampler Macro- sampler 0 Sample collected for off- site laboratory analysis. Sample number:LO19114		coarse, unconsid, poorly sorted, subang to subrd,		samper		sampler is 4ft in length.
(5Y4/1) to it olive gry (5Y6/1), v fine to fine, unconsid, poorly sorted, subang to subrd, wet. 8-9.5ft: Gravelly Silty Clay: (CL), Olive gry (5Y4/1) to it olive gry (5Y4/1), v fine to fine, unconsid, poorly sorted, subang to subrd, wet to saturated. 9.5-12ft: Gravelly Silty Clay: (CL), As above, wet/saturated. 15 20 3 macro-sampler 4 Macro-sampler 5 Sample collected for off-site laboratory analysis. Sample number:LO19114	5		2	Macro-	0	
8-9.5ft: Gravelly Silty Clay: (CL), Olive gry (5Y4/1) to it olive gry (5Y6/1), v fine to fine, unconsid, poorly sorted, subang to subrd, wet to saturated. 9.5-12ft: Gravelly Silty Clay: (CL), As above, wet/saturated. 15 20 20 3 Macrosampler 4 Macrosampler 0 Sample collected for off-site laboratory analysis. Sample number:LO19114		(5Y4/1) to It olive gry (5Y6/1), v fine to fine,	-	i		·
10 (5Y4/1) to it olive gry (5Y6/1), v fine to fine, unconsid, poorly sorted, subang to subrd, wet to saturated. 9.5-12ft: Gravelly Silty Clay: (CL), As above, wet/saturated. 15 20 20 20 20 20 20 20 20 20 20 20 20 20		8-9.5ft: Gravelly Silty Clay: (CL), Olive gry	3	Macro-	0	
saturated. 9.5-12ft: Gravelly Silty Clay: (CL), As above, wet/saturated. 15 20 20 3 saturated. 4 Macrosampler Sample collected for off-site laboratory analysis. Sample number:LO19114		(5Y4/1) to It olive gry (5Y6/1), v fine to fine,		sampler		·
9.5-12ft: Gravelly Silty Clay: (CL), As above, wet/saturated. 15 20 20 3.5-12ft: Gravelly Silty Clay: (CL), As above, wet/saturated. 4 Macrosampler 5 Sample collected for off-site laboratory analysis. Sample number:LO19114	10_	unconsid, poorly sorted, subang to subrd, wet to				
wet/saturated. sampler site laboratory analysis. Sample number:LO19114						
15 Sample number:LO19114		9.5-12ft: Gravelly Silty Clay: (CL), As above,	4	Macro-	0	Sample collected for off-
20	-	wer/saturated.		sampler		
	15	=				Sample number:LO19114
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Projec	t Name: Loring AFB	1			Borehole No.: PBH-8
Projec	t Number: 22784	Elevati	on:	TBD	
Locati	on: JEBS	Date S	tarted:8	27/98	Date Completed: 8/27/98
Driller:	Patrick St. Peter and Sons		epth (ft)		16.1
Equipi	ment: Geoprobe	Depth	to Bedro	ck (ft).	16.1
Drilling	Method: Drive/Hammer	Hole D	iameter	(in):	2
Drilling	g Fluid: None		to Water	` 	7
Compl	letion: Completed as Perimeter Borehole		By: P.		
Depth (ft)	Description	Sample Number	Sample Type	Hnu Reading	Comments
_	0-4ft: Gravelly Clayey Sandy Silt: (ML), Med	1	Macro-	0	The Geo-probe Macro-
_	yel brn (10YR5/4) to lt olive gry (5Y6/1) to olive gry (5Y4/1), fine to v fine, unconsld, poorly sorted, subang to subrd, moist.		sampler		sampler is 4ft in length.
5_	4-8ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid	2	Macro- sampler	0	
_	subang to subrd, moist. 8-12ft: Gravelly Clayey Silt: (ML), As above,	2			
_	moist.	3	Macro-	0	
10	-		sampler		
_	· -				
	12-14ft: Gravelly Clayey Silt: (ML), As above, moist.	4	Macro-		Sample collected for off-
	14-16.1ft: Gravelly Clayey Silt: (ML), As above.	5	sampler		site laboratory analysis.
15	The transfer of the control of the c	3	Macro- sampler	0	Sample number:LO19114
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Projec	t Name: Loring AFB			·	Borehole No.: PBH-9
	t Number: 22784	Elevat	ion:	TBD	
Locati	on: JEBS	Date S	tarted:9	/4/98	Date Completed: 9/4/98
Driller.	Patrick St. Peter and Sons	Total L	Pepth (ft)	:	16.5
	ment: Geoprobe	Depth	to Bedro	ck (ft)	: 16.5
Drilling	g Method: Drive/Hammer		iameter		2
Drilling	g Fluid: None	+	to Water	· · ·	TBD
Compi	letion: Completed as Perimeter Borehole		By: P.		
Depth (ft)	Description	Sample Number	Sample Type	Hnu Reading	Comments
l <u> </u>	0-0.5ft: Concrete				The Geo-probe Macro-
-	0.5-4ft: Gravelly Sandy Clay: (CL), Mod olive brn	1	Macro-	0	sampler is 4ft in length.
5_	(5Y4/4), gravels to 5cm angular edges, moderate cementation, clay content increases with depth, moist.		sampler		-
_	4-8ft: Gravelly Sandy Clay: (CL), Olive gry	2	Macro-	0	1
_	(5Y4/1), moist, low plasticity, v slow dilatence,		sample		
_	gravels to 2cm, gravels rounded, no oder.				
	8-12ft: Gravelly Sandy Clay: (CL), Mod olive	3	Macro-	0	
10_	brn (5Y4/4), as above.		sample		
_	,				
	12-14ft: Gravelly Sandy Clay: (CL), As above.	4	Macro-	0	
] _			sampler		
1	14-16ft: Gravelly Sandy Clay: (CL), Mod olive	5	Macro-	0	
15_	brn (5Y4/4), as above.		sampler		
i 4	16-16.5ft: Gravelly Sandy Clay: (CL), As above.	6	Macro-	22	Sample collected for off-
			sampler	-	site laboratory analysis.
		i			Sample number:LO19091
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Projec	t Name: Loring AFB	<u> </u>	· · · · · · · · · · · · · · · · · · ·		Borehole No.: PBH-10
Project	t Number: 22784	Elevati	on:	TBD	
Location	on: JEBS	Date S	tarted:9/	4/98	Date Completed: 9/4/98
Driller:	Patrick St. Peter and Sons	Total D	epth (ft)		12.5
Equipn	ment: Geoprobe	Depth t	o Bedro	ck (ft).	12.5
Drilling	Method: Drive/Hammer	Hole D	iameter	(in):	2
Drilling	Fluid: None	Depth t	o Water	(ft):	TBD
Compl	etion: Completed as Perimeter Borehole	Logged	By: P.	Bond	
<u></u>					
			pe	ng	
₽	5		Sample Type	Hnu Reading	_
) H	Description	ple per	Be	P. B.	Comments
Depth (ft)		Sample Number	E	2	
<u> </u>	0-0.5ft: Concrete	ΰZ	Ö	エ	The Co.
-		_			The Geo-probe Macro-
-	0.5-4ft: Gravelly Sandy Clay: (CL), Mod olive	1	Macro-	0	sampler is 4ft in length.
-	brn (5Y4/4), gravels to 4cm mostly angular edges,		sampler		
	moist, clay content increases with depth, low				
	plasticity, v slow dilatence.	_			
_	4-8ft: Gravelly Sandy Clay: (CL), Mod olive brn	2	Macro-	0	
	(5Y4/4) intermingled with It olive gry (5Y5/2),		sampler		
	moist, gravels 11cm rounded.				
10	8-12.5ft: Gravelly Sandy Clay: (CL), As above, moist.	3	Macro-	0	Sample collected for off-
''-	moist.		sampler		site laboratory analysis.
-	_				Sample number:LO19053
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H-Nu Survey

Borehole: JEBSO	11617 (PB-1) Storage Temp	~	٥F
Date: 8.27.98				
Depth (ff)	PID Scan Reading (ppm)	PID Headspace Reading (1pm)		
5-0	0			
2-4	0			
4-6:	O		•	
6-8				
8-10	0	•		
10-12				
12-14	O			•
14-16	O	17 4019123	٠	
16-17			ij	
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Technician: PROSSIGNOL / G. BERUBE

H-Nu Survey

	Borehole: <u>JEBSO</u>	<u> 21820 (PB</u> -	2) Storage Temp	~	°F
	Date: 8 27 98		Pip		
	Depth (ff)	PID Scan Reading (ppm)	Headspace Reading (1pm)		
	0-2	0			
	4-6 :				
	<u>6-8</u> 8-10	0			
	<u>10-12</u> 12-14				
	14-16 16-18	0	. 2	,	
AMPLE —	18-20	. 0	28 <u>L019119</u>		
					•
	Technician: PROSSIGNOL	: -/G.BERUBE			

Borehole: <u>JEBS</u>	31618 (PB-3) Storage Temp	~	°F
Date: 827.	78			
Depth ([]	PID Scan Reading (ppm)	PID Headspace Reading (1Pm)		
<u>0-2</u> 2-4	0			
<u>4-6</u> :	0			
<u>8-10</u> 10-12	0			
<u> 12 - 14</u> 14 - 16	0			
16-18 18-20	<u>13</u> _6	23 <u>L019124</u> 22	1	•
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Technician: PROSSIGNOL 16 BERUBE

	Borehole: JEBSO	41617 (PB-2	1 Storage Temp	~	۰F
	Date: 8.27.98		Pip		
	Depth (ff)	PID Scan Reading (ppm)	Headspace Reading (1Pm)		
	0-2	0			
	<u>4-6</u>	0	·		
	<u>6-8</u> <u>8-10</u>	0			
	<u> 10-12</u> <u>12-14</u>	<u> </u>			
MPLE -	<u>14 - 16</u> → 16 - 17.5	0	27 <u>L019117</u>	j	
		<u></u>			
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Technician: PROSSIGNOL/G BERUBE

		Storage Temp	~ °F
Date: 8279	8		
Depth (ff)	PID Scan Reading (ppm)	PIP Headspace Reading (1pm)	
<u>.0-2</u> 2-4	0		
<u>4-6</u> :	0		
<u>8-10</u> 10-12	0		
12-14 14-16	0	15 L019116	
			<i>i j</i>
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Technician: PROSSIGNOL/G BERUBE

Borehole: <u>JEBS061</u>	416 (PB-6)	Storage Temp	~	٥٢
Date: 8.27.98		D. 0		
Depth (ff)	PID Scan Reading (ppm)	PIP Headspace Reading (1pm)		
<u>0-2</u> 2-4	0			
4-6 :	0			
<u>6-8</u> 8-10	0	·		
10-12				
12-14	0	6 2019115		
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Technician: PROSSKNOL/G. RERURE

Borehole: <u>TEBSO7</u>	012 (PB-7	T) Storage Temp	~	٥٢
Date: <u>827.98</u>		P. 0		
Depth (ff)	PID Scan Reading (ppm)	PIP Headspace Reading (1pm)		
0-2	0			
<u>2-4</u>	0	•		
4-6 :				
8-10	$\overline{}$		•	
<u>→ 10-12</u>	0	29 1019114		
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Technician: PROSSIGNOL/G BERVISE

Date: 8.2	7.98	D 0		
Depth (FF)	PID Scan . Reading (ppm)	PIP Headspace Reading (1pm)		
<u>0-2</u> 2-4				
4-6				
<u>6-8</u> 8-10				
10-12 12-14		25 LO19112		
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	SSIGNOL/G.BERUBE			

Borehole: PBH-1	09/	JEBS09 (PB-	9) Storage	Teng	, ~	٥F
Date: 9-4-98		*	V	•		
Depth (FF)		PID Scan Reading (ppm)	P.ID Headspace Reading (1	pm)		
.0-2		\mathcal{O}				
2-4.		<u> </u>		•	•	
4-4				:		
<u>6-8</u>						
8-10	٠,					
10-12		0				
12-14						
14-16		20	22 201909	1		
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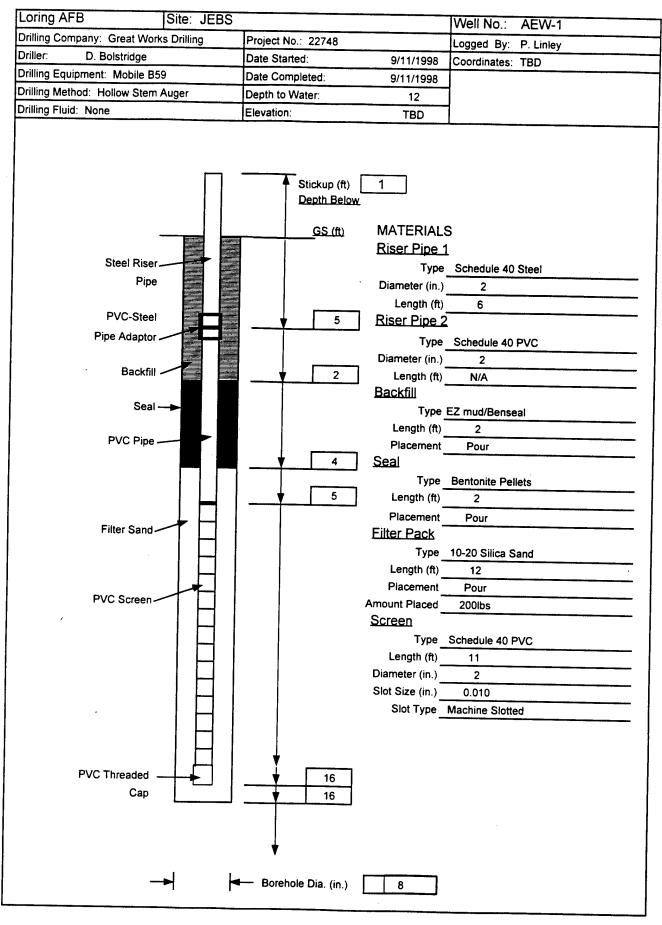
Borehole: JEBS 10	(PB-10)	Storage Temp	~	٥Ę
Date: 9-4-98	PID	Pip		
Depth (FF)	Scan Reading (ppm)	Headspace Reading (1pm)		
02	0			
2-4	0			
6-8	0			
8-10	0			
10.12 12-14/2.5		18_1019053 2019039.5		
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Technician:

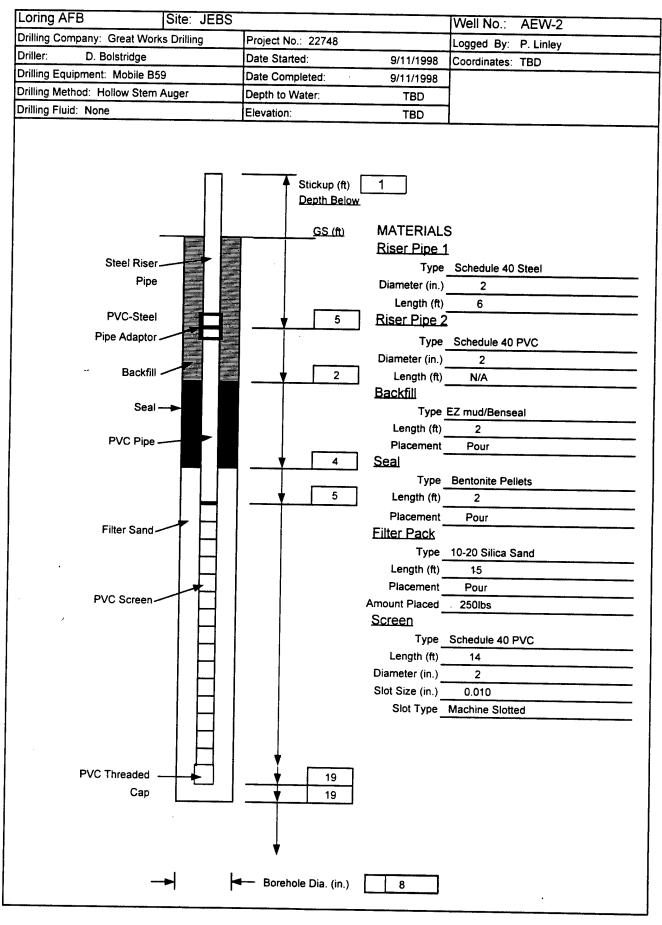
APPENDIX B

AIR EXTRACTION WELL, PASSIVE AIR VENT, MONITORING POINT BORING LOGS AND WELL CONSTRUCTION LOGS

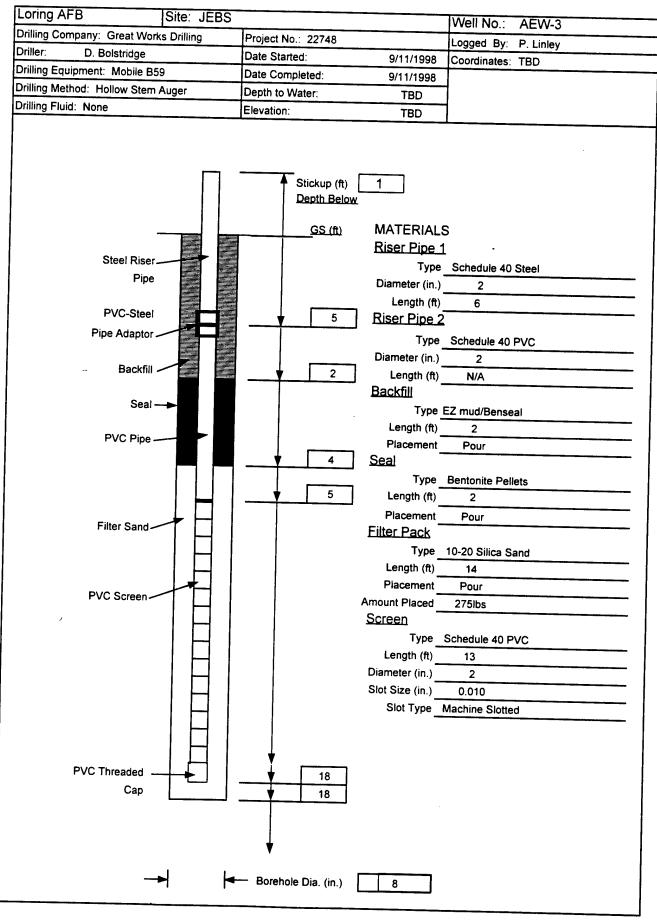
Projec	et Name: Loring AFB	T			
	ot Number: 22784	<i></i>	•		Borehole No.: AEW-1
	on: JEBS	Elevati		TBD	
	: Great Works Drilling	Date S	tartea:9/	/11/98	Date Completed: 9/11/98
	ment: Mobile B59		Pepth (ft)		16
			to Bedro		16
	g Method: Hollow Stem Auger		iameter		8
Comp	g Fluid: None		to Water		12
Comp	letion: Completed as a Soil Vapor Extraction Well	Logged	By: P.	Linley	
	See Construction Log for details				
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
_	0-0.25ft: Asphalt				No samples required to be
_	0.25-0.75ft: Fill - Gravel				collected during installation
_	0.75-16ft: Gravelly Clayey Silt: (ML), Lt olive				9
	gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly				
5_	sorted, unconsid, subang to subrd.				
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_	8ft: Moist.				
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	12ft: Wet to soupy.		. [j
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	16ft: Bedrock: Limestone.		I		ł
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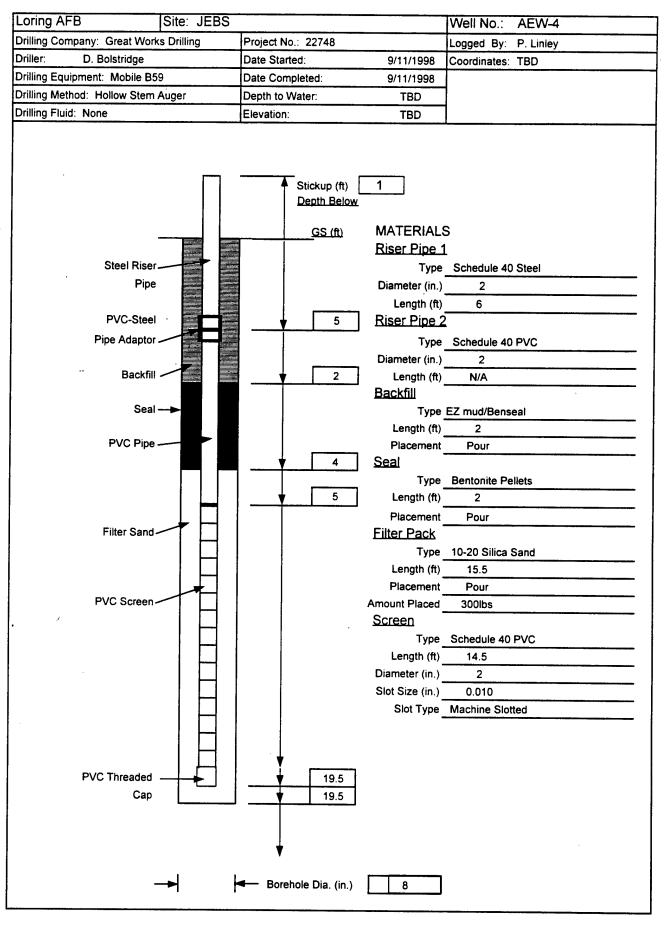
Projec	t Name: Loring AFB				Borehole No.: AEW-2		
Projec	t Number: 22784	Elevati	on:	TBD	712772		
Location: JEBS			Date Started:9/11/98 Date Completed: 9/11/98				
	Great Works Drilling	Total D	epth (ft)		19		
	ment: Mobile B59	Depth t	o Bedro	ck (ft):	19		
	g Method: Hollow Stem Auger		iameter		8		
	g Fluid: None	Depth t	o Water	(ft):	TBD		
Comp	letion: Completed as a Soil Vapor Extraction Well	Logged	I By: P.	Linley			
	See Construction Log for details				·		
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
	0-0.25ft: Asphalt				No samples required to be		
-	0.25-0.75ft: Fill - Gravel				collected during installation		
-	0.75-19ft: Gravelly Clayey Silt: (ML), Lt olive						
5	gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly						
~-	sorted, unconsid, subang to subrd.				Refusal at 5ft BGL,		
-	ļ ["]				relocated approx. 6ft south		
-	. 4				of original location to		
-	-				continue advancement.		
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	19ft: Bedrock: Limestone.				İ		
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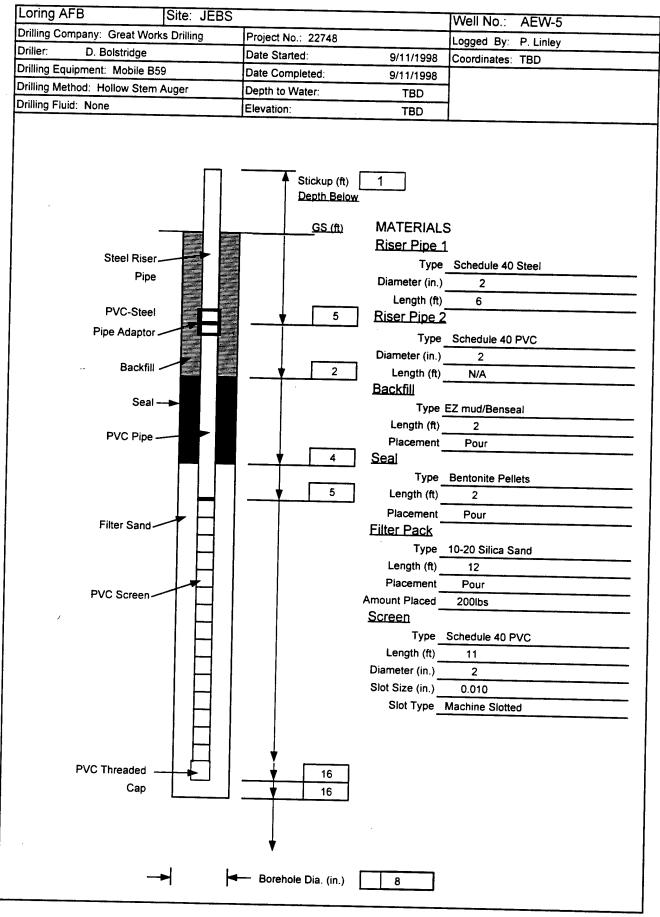
Projec	t Name: Loring AFB				Borehole No.: AEW-3
	t Number: 22784	Elevati	on:	TBD	
Locati	on: JEBS	Date S	tarted:9/		Date Completed: 9/11/98
Driller.	Great Works Drilling		epth (ft)		18
	ment: Mobile B59		o Bedro		
Drilling	Method: Hollow Stem Auger		iameter		8
	r Fluid: None		o Water		TBD
Comp	etion: Completed as a Soil Vapor Extraction Well		By: P.		
	See Construction Log for details		·	·	
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments .
_	0-0.25ft: Asphalt				No samples required to be
	0.25-0.75ft: Fill - Gravel				collected during installation
_	0.75-18ft: Gravelly Clayey Silt: (ML), Lt olive				Refusal at 3ft BGL, (3x),
5	gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly		P		1st refusal relocated 3ft
"-	sorted, unconsid, subang to subrd.				north of original location,
_	-				2nd refusal relocated 6ft
1 –	· _		·		east of original location,
<u> </u>	-				3rd refusal relocated 6ft
10	_				north of original location.
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	18ft: Bedrock: Limestone.			-	
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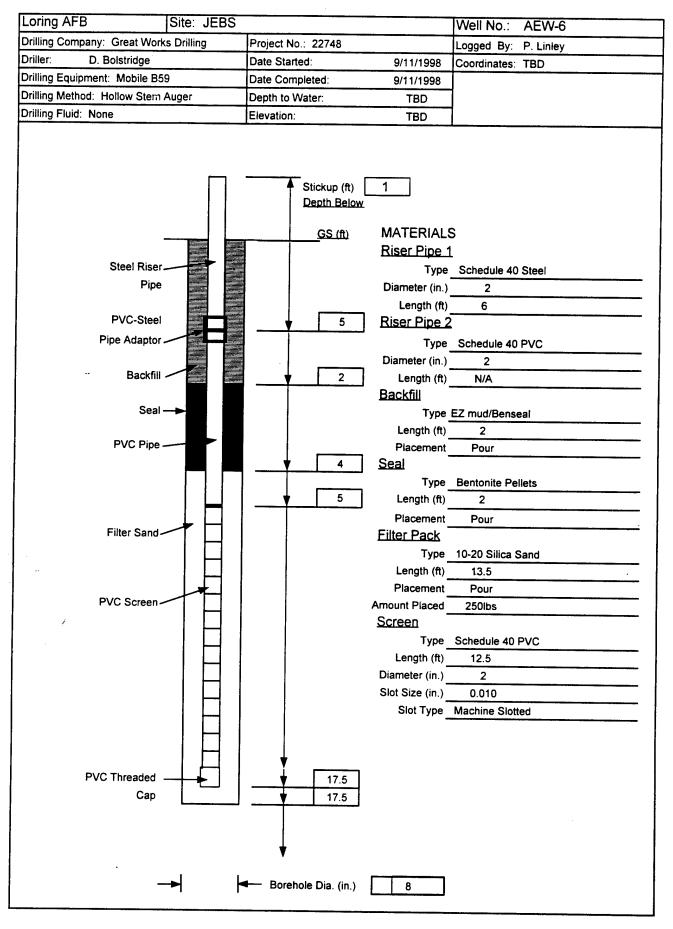
Projec	t Name: Loring AFB				Borehole No.: AEW-4
	t Number: 22784	Elevation		TBD	
	on: JEBS	Date Si	tarted:9/	11/98	Date Completed: 9/11/98
	Great Works Drilling	Total D	epth (ft).	•	19.5
Equipr	ment: Mobile B59	Depth t	o Bedro	ck (ft):	19.5
	Method: Hollow Stem Auger	Hole Di	iameter ((in):	8
	Fluid: None	Depth t	o Water	(ft):	TBD
Compl	etion: Completed as a Soil Vapor Extraction Well See Construction Log for details	Logged	By: P.	Linley	
	T		r	r	
æ				Blow Count	
Depth (ft)	Description	Sample Number	흥	ပိ	Comments
효	'		Sample Type	⋛	
ے		Sa	Sa Ty	ă	
_	0-0.25ft: Asphalt				No samples required to be
_	0.25-0.75ft: Fill - Gravel				collected during installation
	0.75-19.5ft: Gravelly Clayey Silt: (ML), Lt olive				
_	gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly				
5_	sorted, unconsid, subang to subrd.				Refusal at 5ft BGL,
	<u> </u>				relocated approx. 4ft east
_]				of original location.
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-	19.5ft: Bedrock: Limestone.				
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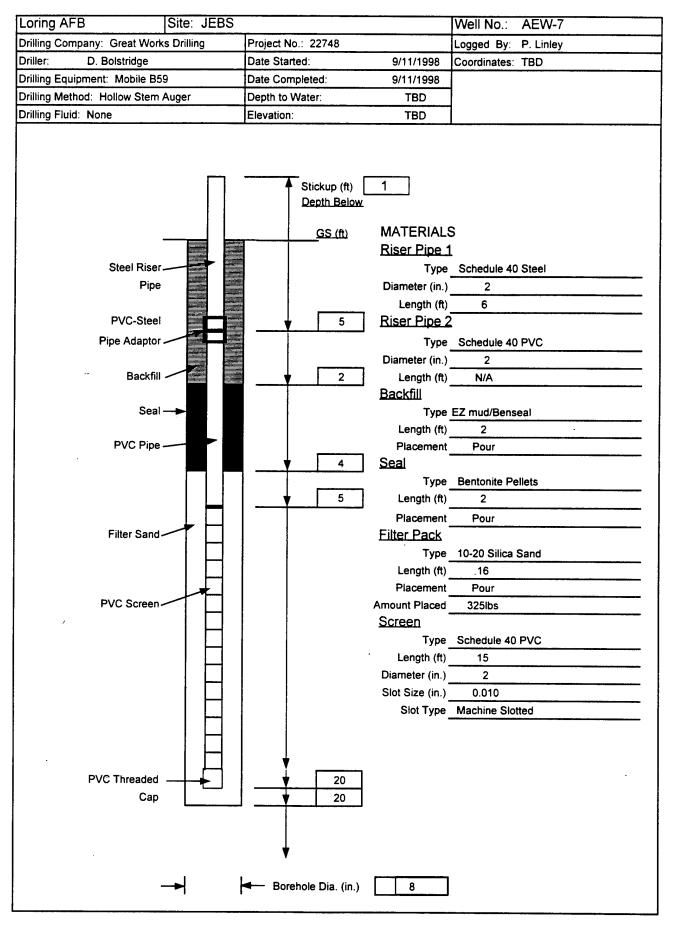
Projec	t Name: Loring AFB				Borehole No.: AEW-5	
	t Number: 22784	Elevation: TBD				
	on: JEBS	I			Date Completed: 9/11/98	
Driller:	Great Works Drilling	Total Depth (ft): 16				
	ment: Mobile B59		o Bedro			
Drilling	Method: Hollow Stem Auger		iameter		8	
	g Fluid: None		o Water		TBD	
Compi	letion: Completed as a Soil Vapor Extraction Well	Logged	By: P.	Linley		
	See Construction Log for details		T			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments	
l _	0-0.25ft: Asphalt				No samples required to be	
_	0.25-0.75ft: Fill - Gravel				collected during installation	
_	0.75-16ft: Gravelly Clayey Silt: (ML), Lt olive					
	gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly					
5_	sorted, unconsid, subang to subrd.					
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_	16ft: Bedrock: Limestone.					
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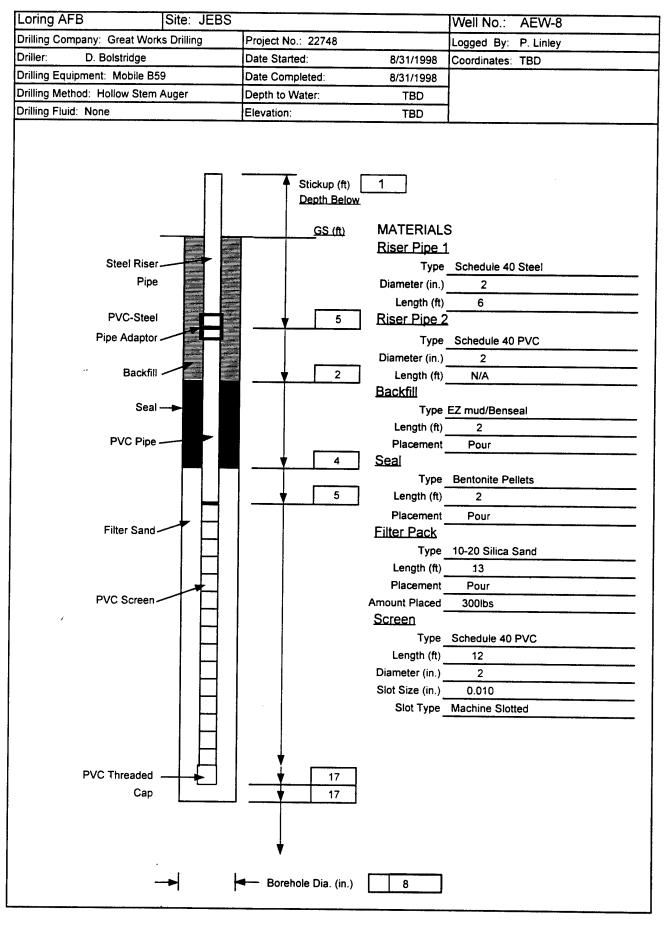
Projec	ct Name: Loring AFB			··	Roroholo No : AFIM 6			
Project Number: 22784			Borehole No.: AEW-6 Elevation: TBD					
	ion: JEBS	Date Started:9/11/98 Date Completed: 9/11/98						
Driller	Driller: Great Works Drilling			Total Depth (ft): 17.5				
	ment: Mobile B59		o Bedro					
Drillin	g Method: Hollow Stem Auger		iameter		8			
	g Fluid: None		o Water		TBD			
Comp	letion: Completed as a Soil Vapor Extraction Well		By: P.					
	See Construction Log for details		_,					
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments			
-	0-0.25ft: Asphalt				No samples required to be			
-	0.25-0.75ft: Fill - Gravel				collected during installation			
_	0.75-17.5ft: Gravelly Clayey Silt: (ML), Lt olive							
5	gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly sorted, unconsid, subang to subrd.		i					
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	17.5ft: Bedrock: Limestone.				·			
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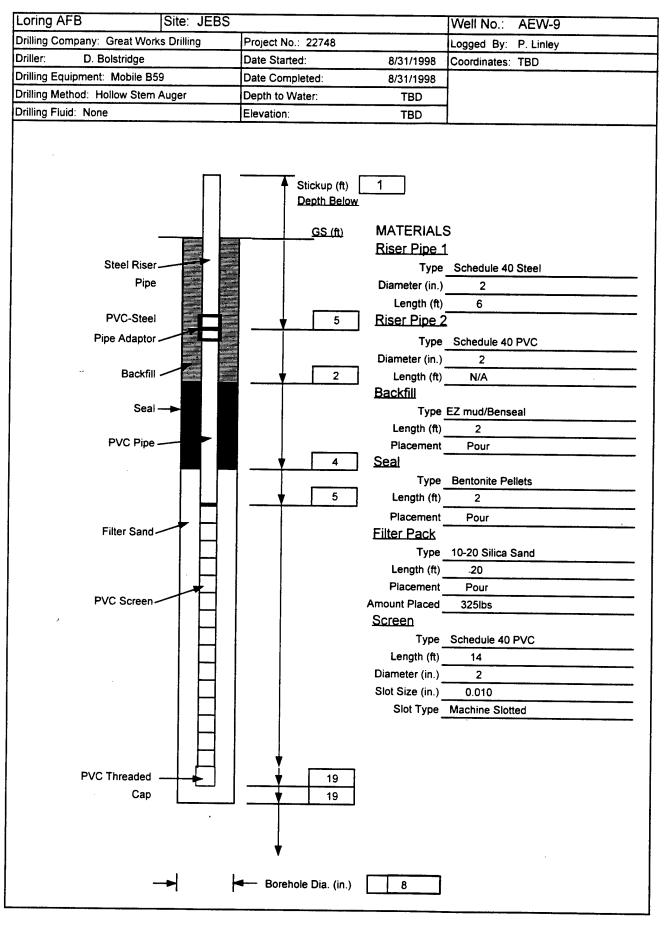
Projec	et Name: Loring AFB	T			Dorobolo No. ACIALT		
	et Number: 22784	Elevati	on:	TBD	Borehole No.: AEW-7		
	on: JEBS	Date Started:9/11/98 Date Completed: 9/11/98					
Driller: Great Works Drilling			Total Depth (ft): 20				
	ment: Mobile B59		to Bedro				
	g Method: Hollow Stem Auger		iameter		8		
	g Fluid: None		o Water		TBD		
	letion: Completed as a Soil Vapor Extraction Well		By: P.				
	See Construction Log for details						
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
_	0-0.25ft: Asphalt				No samples required to be		
-	0.25-0.75ft: Fill - Gravel				collected during installation		
_	0.75-17.5ft: Gravelly Clayey Silt: (ML), Lt olive	!					
5	gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly sorted, unconsid, subang to subrd.						
~ ~	Solice, unconsid, subang to subra.						
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20	20ft: Bedrock: Limestone.						
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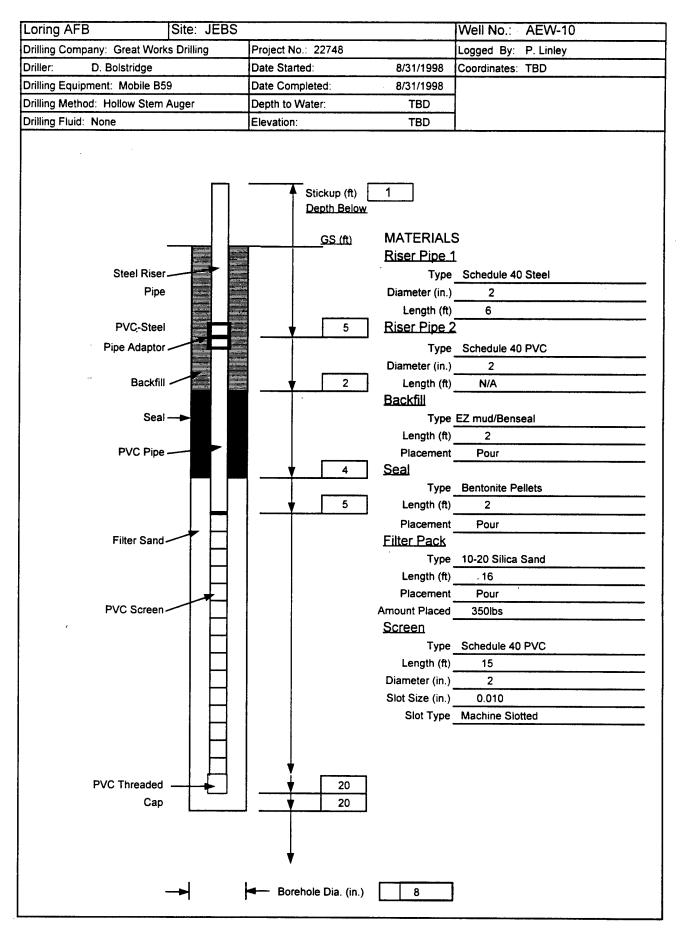
Project Name: Loring AFB	Borehole No.: AEW-8				
Project Number: 22784	Elevation: TBD				
Location: JEBS	Date Started:8/31/98 Date Completed: 8/31/98				
Driller: Great Works Drilling	Total Depth (ft): 17				
Equipment: Mobile B59	Depth to Bedrock (ft): 17				
Drilling Method: Hollow Stem Auger	Hole Diameter (in): 8				
Drilling Fluid: None	Depth to Water (ft): TBD				
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details	Logged By: P. Linley				
Description (#)	Sample Number Sample Type Blow Count				
0-17ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, gvl 4-6 inches in diameter. 10 17ft: Bedrock: Limestone.	No samples required to be				



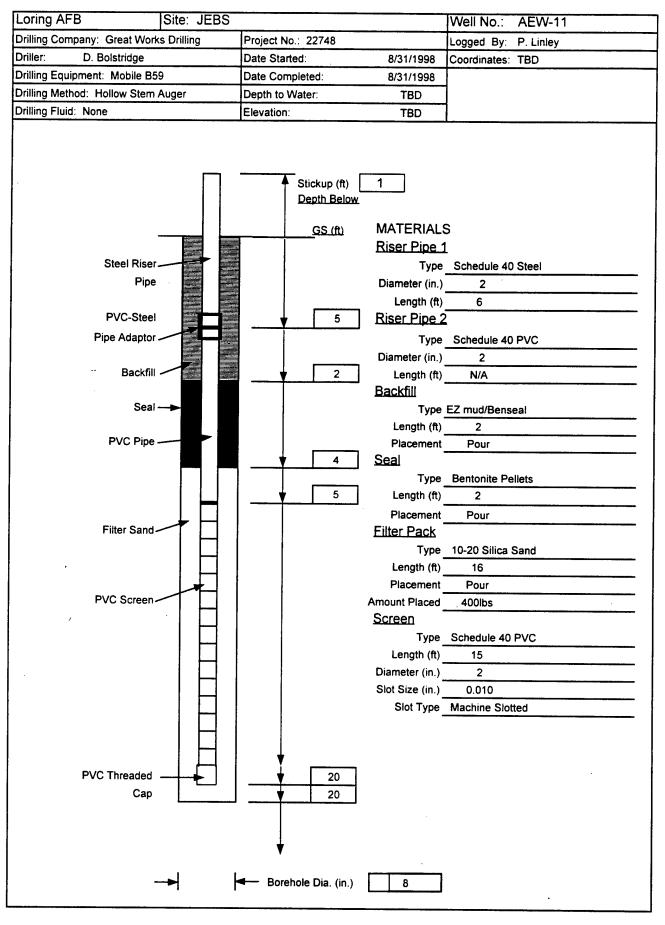
Proj	ect Name: Loring AFB				Borehole No.: AEW-9			
Project Number: 22784			Elevation: TBD					
	Location: JEBS			Date Started:8/31/98 Date Completed: 8/31/98				
	er: Great Works Drilling	Total Depth (ft): 19						
	ipment: Mobile B59	Depth :	o Bedro	ck (ft):				
	ing Method: Hollow Stem Auger	Hole D	iameter	(in):	8			
	ng Fluid: None	Depth i	o Water	(ft):	TBD			
Con	pletion: Completed as a Soil Vapor Extraction Well	Logged	By: P.	Linley				
	See Construction Log for details							
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments			
	0-19ft: Gravelly Clayey Silt: (ML), Lt olive gry	<u> </u>	02.1		No samples required to be			
	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation			
	poorly sorted, subang to subrd.							
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٠,٠	19ft: Bedrock: Limestone.							
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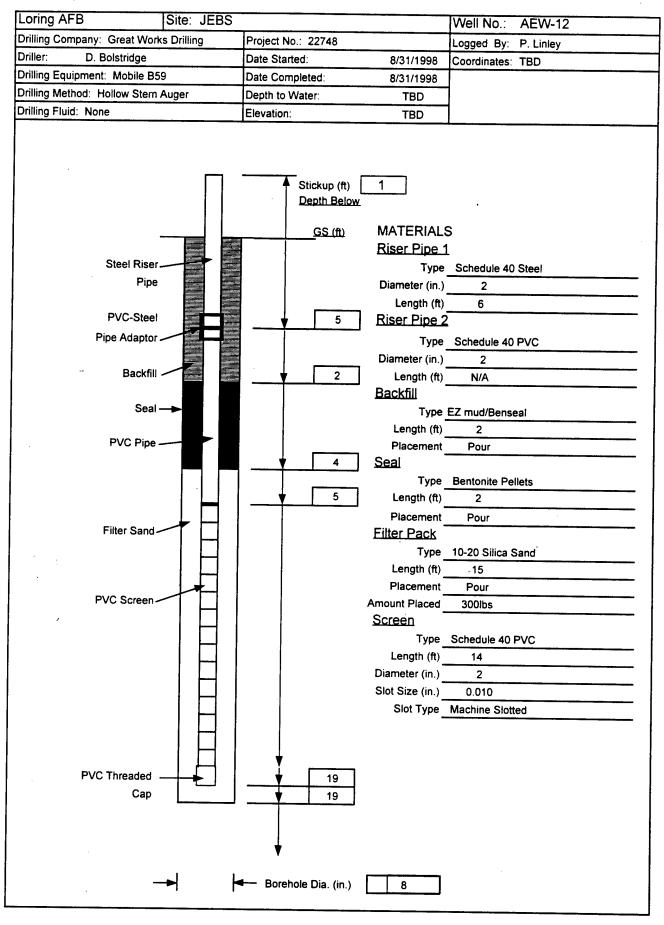
Proiec	t Name: Loring AFB				Porchalo No : AEM 40		
	t Number: 22784	Borehole No.: AEW-10 Elevation: TBD					
	on: JEBS	Date Started:8/31/98 Date Completed: 8/31/98					
	Great Works Drilling	Total Depth (ft): 20					
Equipment: Mobile B59			Depth to Bedrock (ft): 20				
	Method: Hollow Stem Auger		iameter		8		
Drilling	g Fluid: None		o Water		TBD		
Compl	letion: Completed as a Soil Vapor Extraction Well		By: P.				
	See Construction Log for details						
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
_	0-20ft: Gravelly Clayey Silt: (ML), Lt olive gry				No samples required to be		
-	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation		
-	poorly sorted, subang to subrd.						
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20	20ft: Bedrock: Limestone	ŀ					
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Proje	ct Name: Loring AFB	T			Borehole No.: AEW-11			
Project Number: 22784			Elevation: TBD					
Local	ion: JEBS	Date Started:8/31/98 Date Completed: 8/31/98						
Drille	Driller: Great Works Drilling			Total Depth (ft): 20				
Equip	ment: Mobile B59		to Bedro					
Drillin	g Method: Hollow Stem Auger		iameter		8			
	g Fluid: None		to Water		TBD			
Comp	oletion: Completed as a Soil Vapor Extraction Well		By: P.					
	See Construction Log for details							
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments			
-	0-20ft: Gravelly Clayey Silt: (ML), Lt olive gry				No samples required to be			
-	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation			
-	poorly sorted, subang to subrd, gvl to 3 inches in				-			
5	diameter, moist.							
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20-	20ft: Bedrock: Limestone.			i				
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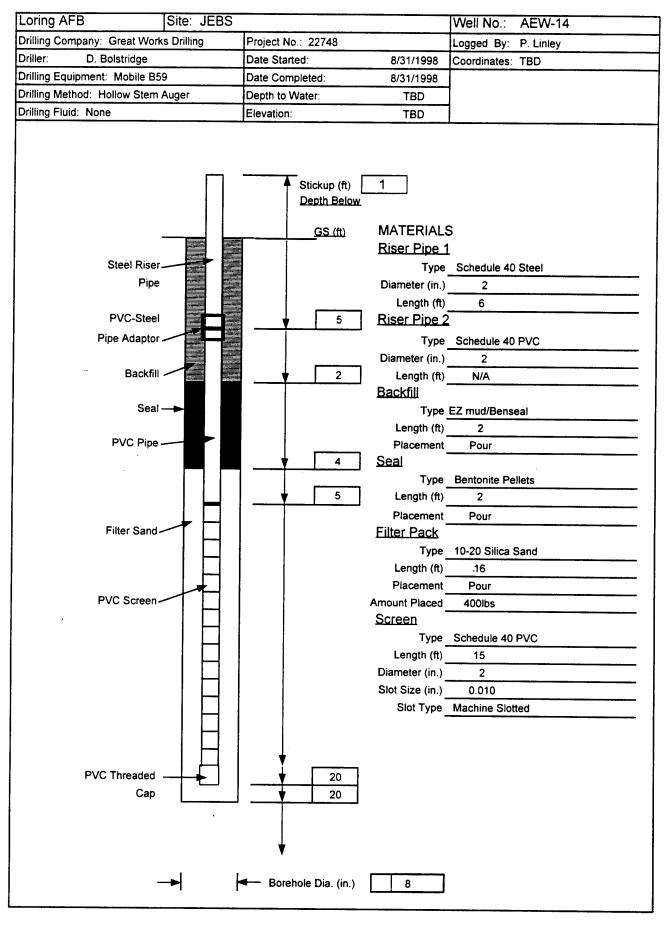
Projec	t Name: Loring AFB				Borehole No.: AEW-12		
Project Number: 22784			Elevation: TBD				
Locati	on: JEBS	Date Started:8/31/98 Date Completed: 8/31/98					
Driller: Great Works Drilling			Total Depth (ft): 19				
	ment: Mobile B59	Depth t	o Bedro	ck (ft):	19		
	Method: Hollow Stem Auger	Hole D	iameter	(in):	8		
	Fluid: None	Depth t	o Water	(ft):	TBD		
Compl	etion: Completed as a Soil Vapor Extraction Well		By: P.				
	See Construction Log for details						
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
	0 10ft: Gravelly Clavery Site. (All.) Lt alice	κ̈́ź	ა ⊢_	В			
-	0-19ft: Gravelly Clayey Silt: <i>(ML)</i> , Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				No samples required to be		
-	poorly sorted, subang to subrd, gvl 5-6 inches in				collected during installation		
-	diameter.						
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	8ft: Moist.						
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15	15-16ft: Cobble zone.						
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	19ft: Bedrock: Limestone.	i					
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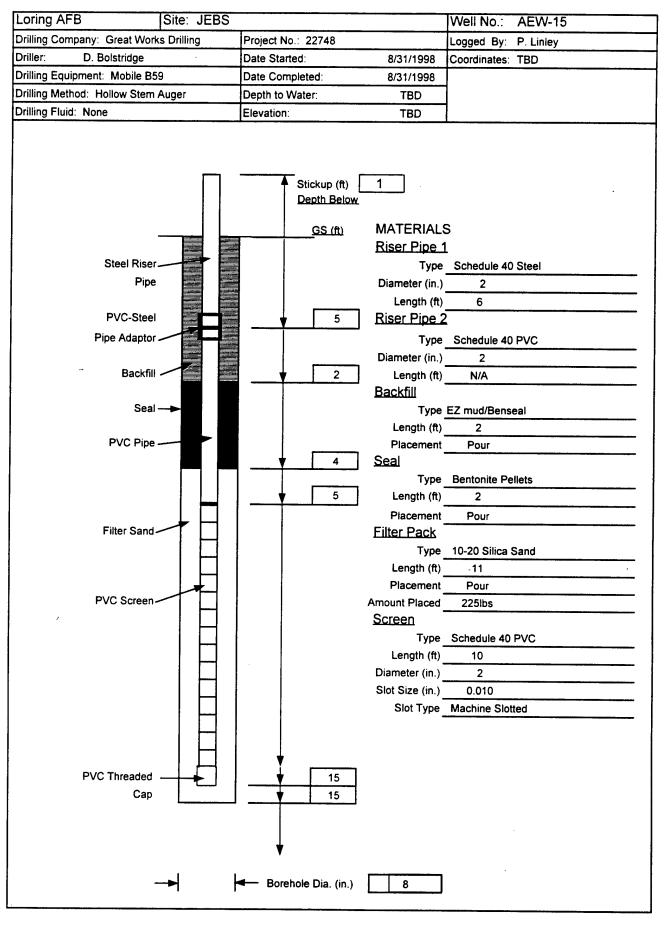
Projec	et Name: Loring AFB	Ţ			Borehole No : AEM/12			
Project Number: 22784			Borehole No.: AEW-13 Elevation: TBD					
Location: JEBS			Date Started:8/31/98 Date Completed: 8/31/98					
Driller.	Driller: Great Works Drilling			Total Depth (ft): 18				
	ment: Mobile B59		to Bedro					
Drilling	Method: Hollow Stem Auger		iameter		8			
	g Fluid: None		to Water		TBD			
Compl	letion: Completed as a Soil Vapor Extraction Well		By: P.					
	See Construction Log for details							
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments			
_	0-18ft: Gravelly Clayey Silt: (ML), Lt olive gry		, , , , , , , , , , , , , , , , , , ,		No samples required to be			
_	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation			
_	poorly sorted, subang to subrd.		[
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l ⊣	9ft: Moist.							
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"-	11ft: V moist.							
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15	15ft: Moist.			ŀ	·			
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	18ft: Bedrock: Limestone.			-	·			
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Projec	et Name: Loring AFB	<u> </u>			Borehole No.: AEW-25
Project Number: 22784			on:	TBD	Dorellole IVO ALVV-25
	on: JEBS	Date Started:9/1/98			Date Completed: 9/1/98
Driller.	Driller: Great Works Drilling				12
Equip	ment: Mobile B59		epth (ft) to Bedro		
Drilling	g Method: Hollow Stem Auger		iameter		8
	g Fluid: None		to Water		TBD
Comp	letion: Completed as a Soil Vapor Extraction Well		By: P.		
	See Construction Log for details				
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
_	0-12ft: Gravelly clayey silt: (ML), Lt olive gry				No samples required to be
_	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation
_	poorly sorted, subang to subrd, gvl to 6 inches in				
5	diameter. 5-5.5ft: Cobble zone.				
~-	10-5.5it. Cobbie zone.				
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	12ft: Bedrock: Limestone.				
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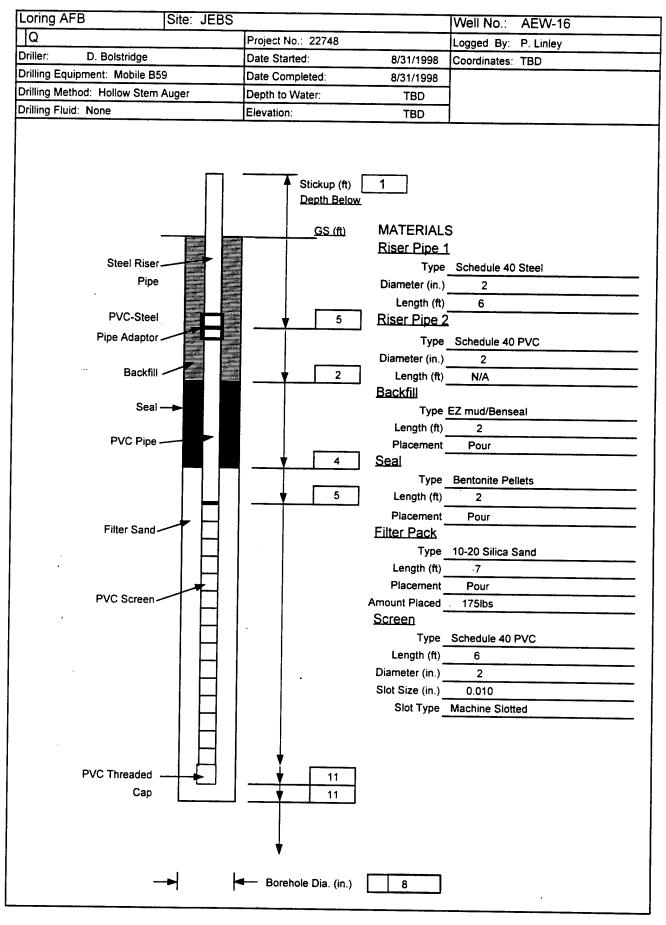
Projec	et Name: Loring AFB	T						
	Desir at Manual Compat			TBD	Borehole No.: AEW-14			
				Date Started: 8/31/98 Date Completed: 8/31/98				
	Great Works Drilling	Total C	larteu.o/	<u>31/90</u>				
	ment: Mobile B59		epth (ft)		20			
	g Method: Hollow Stem Auger		to Bedro					
	g Fluid: None		iameter		8			
Comp	letion: Completed as a Soil Vapor Extraction Well		o Water		TBD			
	See Construction Log for details	Logged	∄By: P.	Liniey				
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments			
_	0-20ft: Gravelly Clayey Silt: (ML), Lt olive gry				No samples required to be			
_	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation			
_	poorly sorted, subang to subrd, gvl to 5 inches in				J			
	diameter.							
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-	19ft: V moist.		1	ļ				
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	ZUIT: Bedrock: Limestone.							
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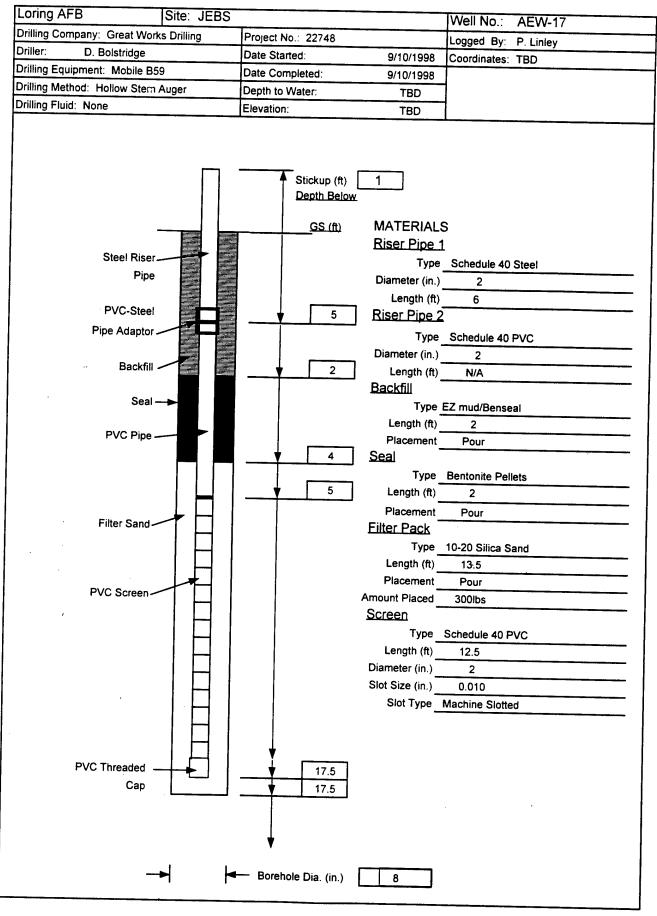
Projec	et Name: Loring AFB	1			Demokala M. A SIM AS	
	Project Number: 22784 Elevation:			Borehole No.: AEW-15 TBD		
	on: JEBS	Date Started:8/31/98 Date Completed: 8/31/98				
	: Great Works Drilling					
	ment: Mobile B59		to Bedro		15 15	
	Method: Hollow Stem Auger		iameter		8	
	g Fluid: None		o Water			
	letion: Completed as a Soil Vapor Extraction Well		By: P.		TBD	
	See Construction Log for details	Logger	г ы у. г.	Liilley		
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듄	Description	ple be	림	Q	Comments	
Depth (ft)		Sample Number	Sample Type	Blow Count		
	0-15ft: Gravelly Clayey Silt: (ML), Lt olive gry	υZ	S F	8	N	
-	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				No samples required to be	
] -	poorly sorted, subang to subrd, gvl to 6 inches in	:			collected during installation	
-	diameter.					
5	5-7ft: Cobble zone.					
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15	15ft: Bedrock: Limestone.					
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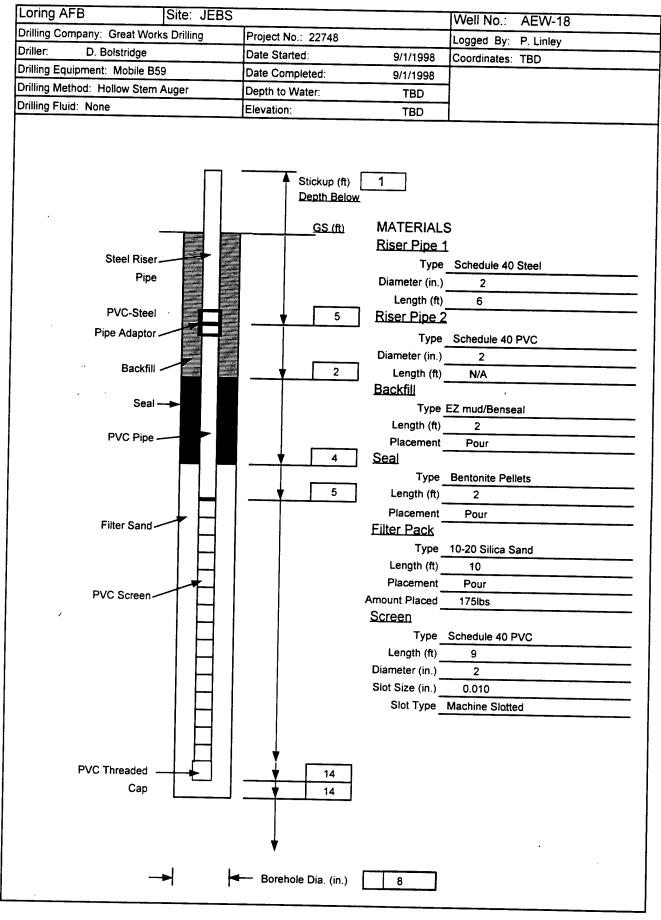
Projec	ct Name: Loring AFB	T			Doroholo No . AFIA/ 46			
	et Number: 22784	Borehole No.: AEW-16 Elevation: TBD						
	on: JEBS	Date Started: 8/31/98 Date Completed: 8/31/98						
Driller.	Driller: Great Works Drilling			Total Depth (ft): 11				
	ment: Mobile B59		to Bedro					
Drilling	g Method: Hollow Stem Auger	Hole D	iameter	(in)	8			
Drilling	g Fluid: None	Depth	o Water	(##)·	TBD			
Comp	letion: Completed as a Soil Vapor Extraction Well		By: P.					
	See Construction Log for details							
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments			
_	0-11ft: Gravelly Clayey Silt: (ML), Lt olive gry				No samples required to be			
-	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation			
-	poorly sorted, subang to subrd, gvl 3-4 inches in	İ			_			
5	diameter.							
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"-	11ft: Bedrock: Limestone.	.		i				
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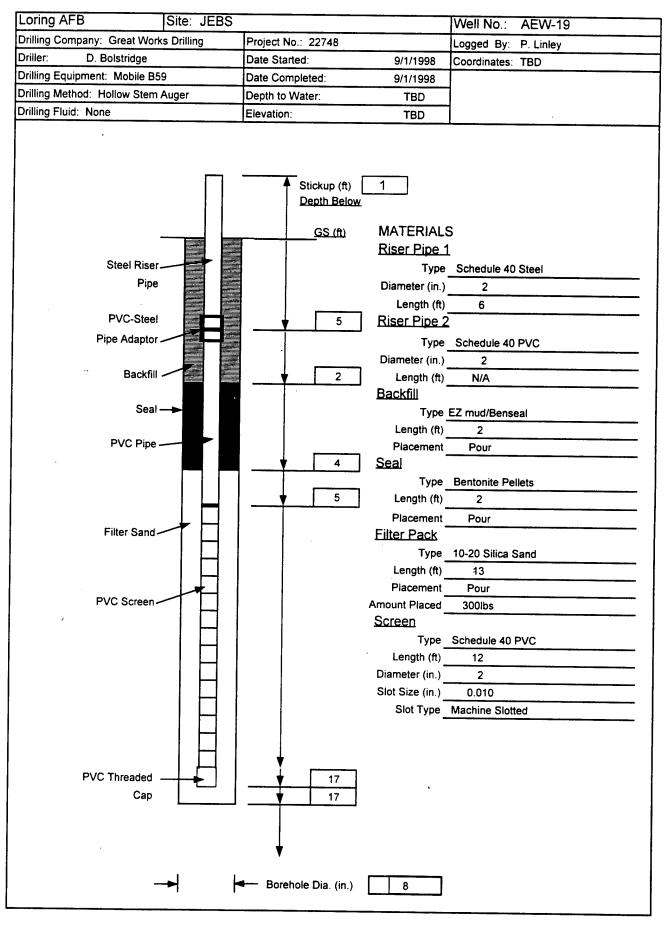
Proje	ct Name: Loring AFB	1			Porcholo No : AFIM 47
	ct Number: 22784	Elevati	ion:	TBD	Borehole No.: AEW-17
Locat	ion: JEBS				Date Completed: 9/10/98
Drille	r: Great Works Drilling	Total Depth (ft):			17.5
	ment: Mobile B59		to Bedro		
Drillin	g Method: Hollow Stem Auger		iameter		8
Drillin	g Fluid: None		to Water		TBD
Comp	oletion: Completed as a Soil Vapor Extraction Well		By: P.		
	See Construction Log for details	Loggo		Liney	
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
10	0-0.25ft: Asphalt 0.25-0.75ft: Fill - Gravel 0.75-17.5ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld, poorly sorted, subang to subrd.	S	S	8	No samples required to be collected during installation



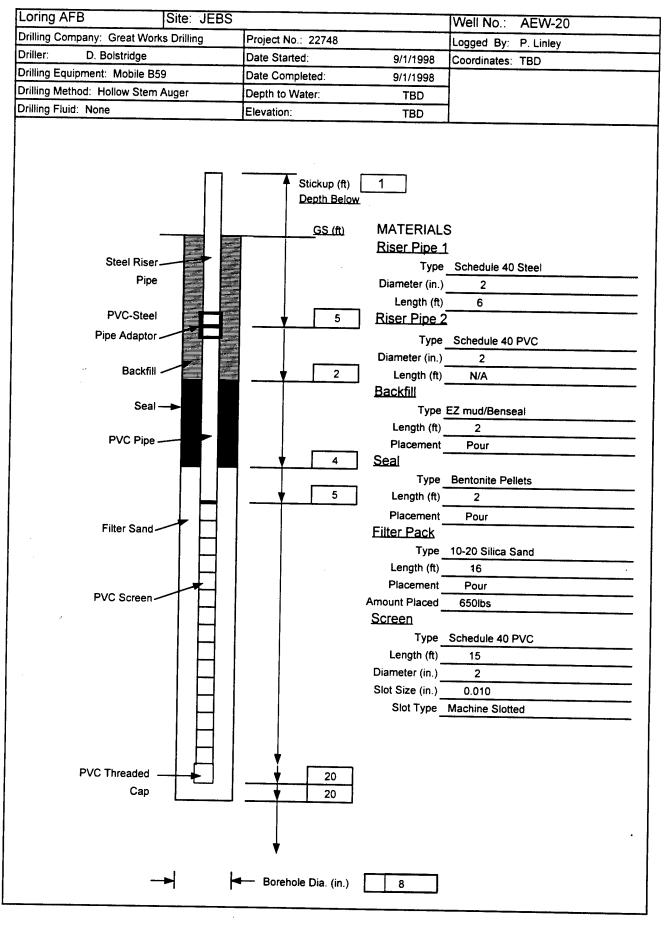
Projec	t Name: Loring AFB				Parahala Na : AFIM 40	
	et Number: 22784	Borehole No.: AEW-1 Elevation: TBD				
	on: JEBS		tarted:9/		Date Completed: 9/1/98	
Driller: Great Works Drilling			epth (ft)		14	
	ment: Mobile B59		to Bedro			
	g Method: Hollow Stem Auger		iameter		8	
Drilling	Fluid: None		to Water		TBD	
	letion: Completed as a Soil Vapor Extraction Well		By: P.			
	See Construction Log for details		. .	Linky		
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Depth (ft)	Description	0 5		Ī		
a fi	Description	를 무	혈		Comments	
De		Sample Number	Sample Type	Blow Count		
	0-14ft: Gravelly Clayey Silt: (ML), Lt olive gry	0, 2	0, 1		No samples required to be	
	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation	
	poorly sorted, subang to subrd, gvl 4-5 inches in		ļ		on octob during matanation	
	diameter.					
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	6ft: Moist.					
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	14ft: Bedrock: Limestone.			ľ	i	
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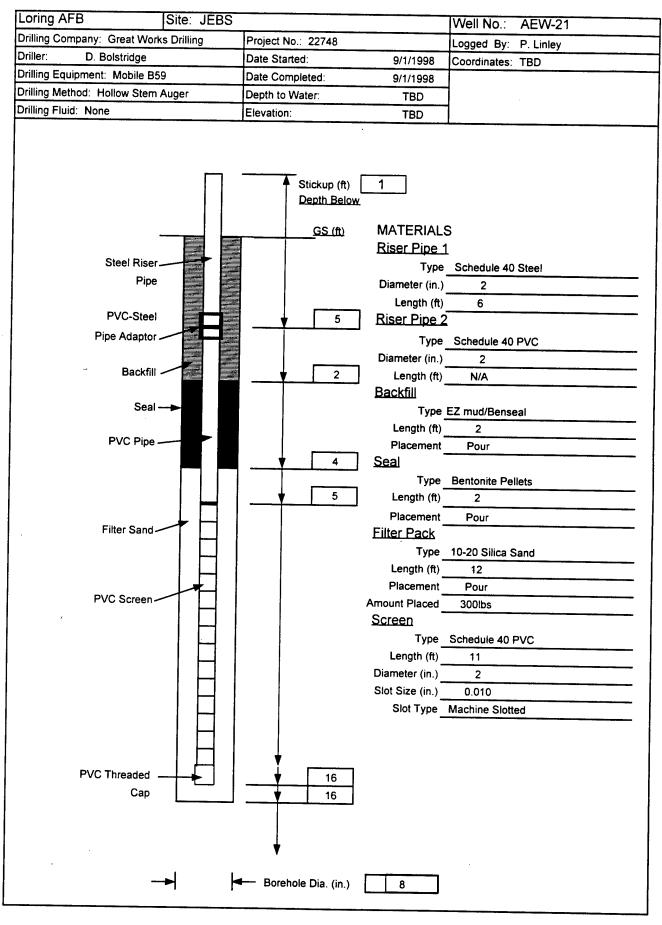
Projec	t Name: Loring AFB				Borehole No.: AEW-19		
Project Number: 22784			Elevation: TBD				
	on: JEBS	Date Started:9/1/98 Date Completed: 9/1/98					
Driller:	Great Works Drilling	Total D	epth (ft)	:	17		
	ment: Mobile B59	Depth t	o Bedro	ck (ft).	17		
Drilling	Method: Hollow Stem Auger	Hole D	iameter	(in):	8		
	r Fluid: None		o Water		TBD		
Compl	etion: Completed as a Soil Vapor Extraction Well	Logged	By: P.	Linley			
	See Construction Log for details						
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
_	0-17ft: Gravelly Clayey Silt: (ML), Lt olive gry				No samples required to be		
_	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation		
_	poorly sorted, subang to subrd, gvl 4-5 inches in						
	diameter.						
5_	C 74. Cabble						
-	6-7ft: Cobble zone.						
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\vdash	17ft: Bedrock: Limestone.						
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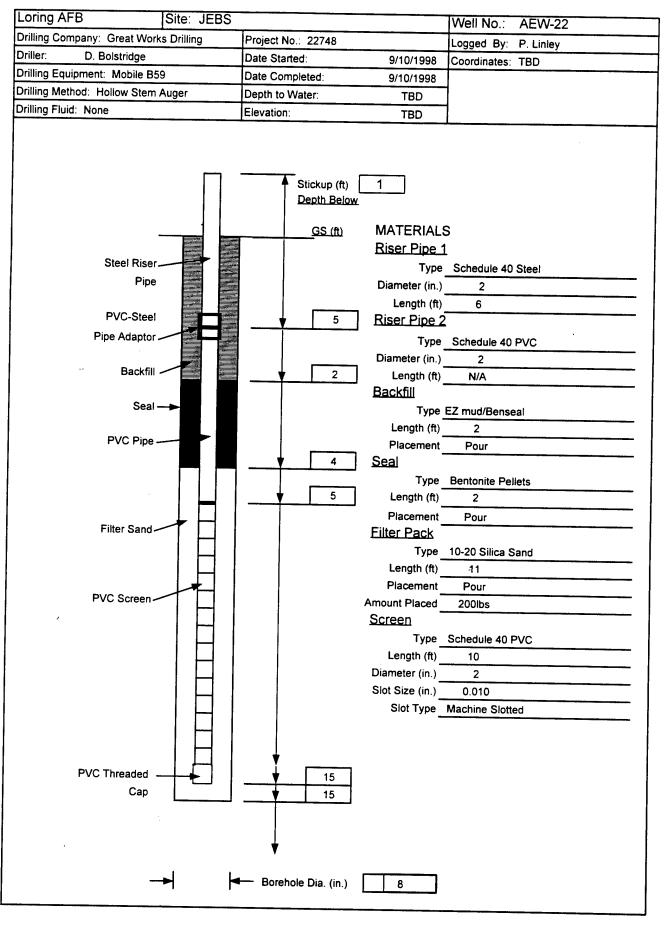
Projec	ct Name: Loring AFB	T			10	
	ot Number: 22784	Borehole No.: AEW-20 Elevation: TBD				
	on: JEBS				I.S	
	: Great Works Drilling	Date Started:9/1/98 Total Depth (ft):			Date Completed: 9/1/98	
	ment: Mobile B59			_	20	
	g Method: Hollow Stem Auger		to Bedro			
Drilling	g Fluid: None		iameter		8	
Comp	letion: Completed as a Soil Vapor Extraction Well	Depth	to Water	(ft):	TBD	
	See Construction Log for details	Logged	d By: P.	Linley		
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments	
-	0-0.5ft: Concrete				No samples required to be	
<u> </u>	0.5-1ft: Fill - Gravel				collected during installation	
-	1-20ft: Gravelly Clayey Silt: (ML), Lt olive gry				3	
5	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld					
~-	poorly sorted, subang to subrd.	*				
-	7ft: Moist.			j	1	
-	71t. WOISt.				j	
-						
10	10ft: Clay fraction increased				·	
I "Ŭ→	10ft: Clay fraction increase to approx. 20%.	:	İ			
-	11ft: Clay fraction decrease to <10%.					
-	12it. v moist.		İ	- 1		
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20	20ft: Bedrock: Limestone.	İ	ŀ		1	
	- Limestone.	[1			
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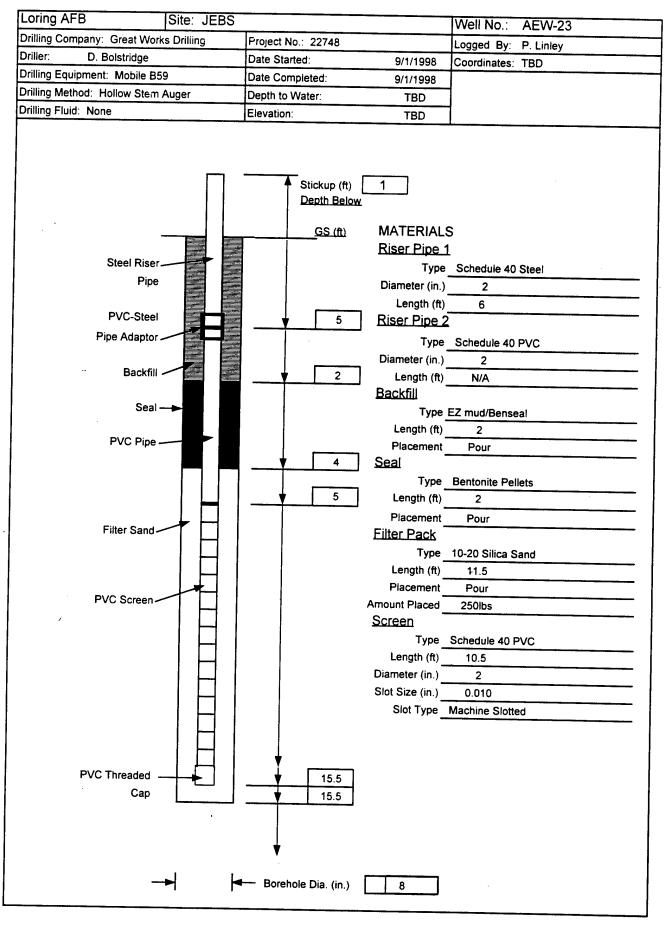
Projec	et Name: Loring AFB				Borehole No.: AEW-21		
Project Number: 22784			Elevation: TBD				
	on: JEBS	Date Started:9/1/98			Date Completed: 9/1/98		
Driller.	Great Works Drilling		epth (ft)	16			
	ment: Mobile B59	}	to Bedro				
Drilling	g Method: Hollow Stem Auger		iameter		8		
	g Fluid: None		to Water	<u> </u>	12		
Comp	letion: Completed as a Soil Vapor Extraction Well		By: P.	·			
	See Construction Log for details						
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
_	0-0.5ft: Concrete				No samples required to be		
-	0.5-1ft: Fill - Gravel				collected during installation		
_	1-8ft: Clayey silty gravel: (GP), Lt olive gry						
5-	(5Y6/1) to olive gry (5Y4/1), v fine to coarse,						
~-	unconsld, poorly sorted, subang to subrd.						
_	-				İ		
	8-16ft: Gravelly clayey silt: (<i>ML</i>), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld subang to subrd, v moist to wet, gvl 2-3 inches in diameter.						
	11-11.5ft: Cobble zone.		;	Ì			
	12ft: water, soupy cuttings.						
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15	+]					
	16ft: Bedrock: Limestone.	ĺ					
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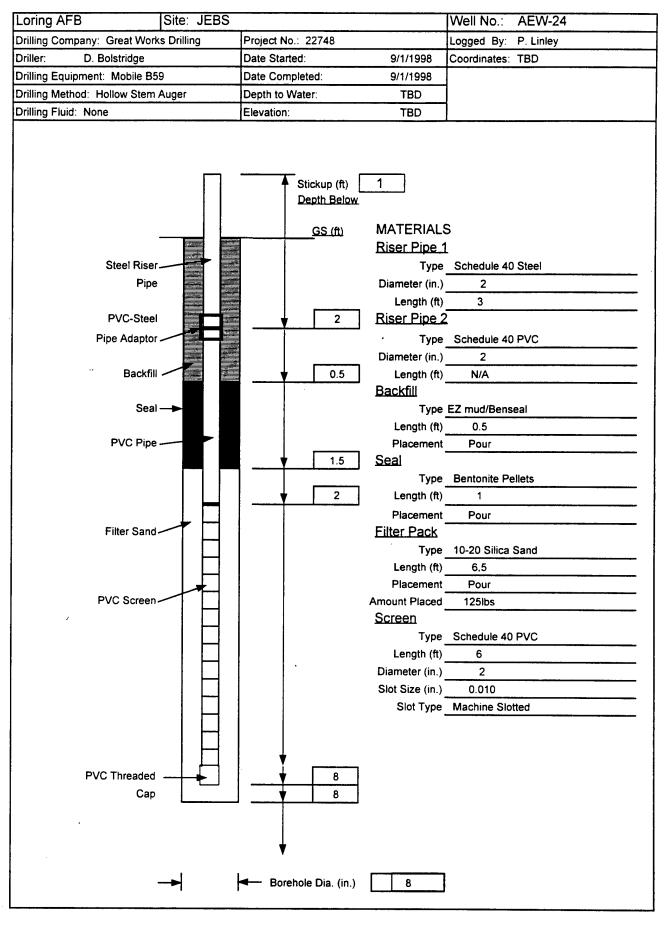
Projec	t Name: Loring AFB				Borehole No.: AEW-22		
Project Number: 22784			Elevation: TBD				
Location: JEBS			Date Started:9/10/98 Date Completed: 9/10/98				
Driller: Great Works Drilling			Total Depth (ft): 15				
	ment: Mobile B59		o Bedro				
Drilling	n Method: Hollow Stem Auger		iameter		8		
	g Fluid: None		o Water		TBD		
Compi	letion: Completed as a Soil Vapor Extraction Well		By: P.				
	See Construction Log for details						
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
_	0-0.25ft: Asphalt				No samples required to be		
_	0.25-1ft: Fill - Gravel				collected during installation		
	1-15ft: Gravelly clayey silt: (ML), Lt olive gry			Ì			
	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid						
5_	poorly sorted, subang to subrd.						
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15	15ft: Bedrock: Limestone.]		
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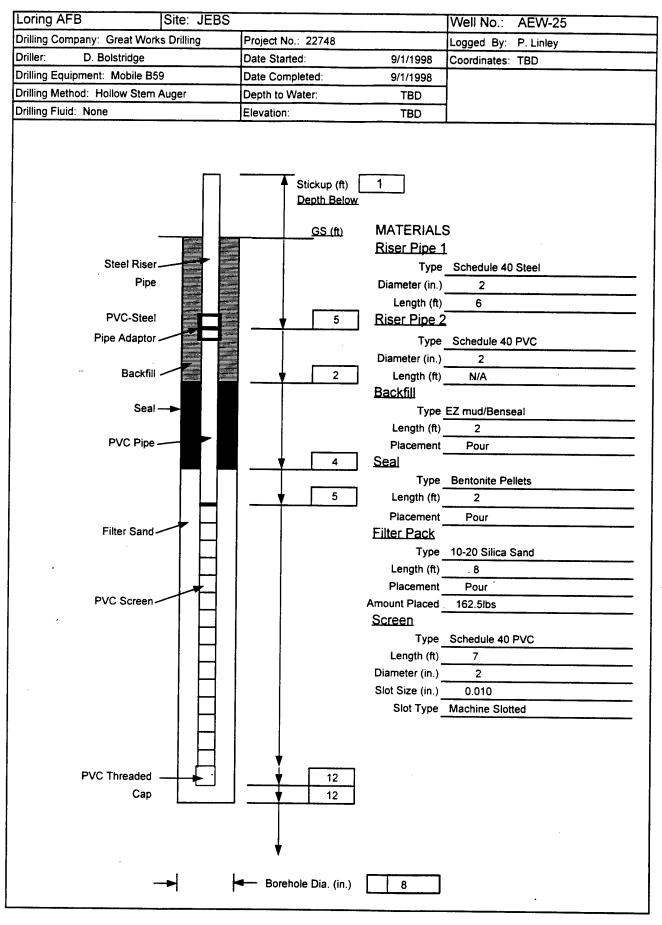
Projec	t Name: Loring AFB	Γ			Borehole No.: AEW-23		
Project Number: 22784			Elevation: TBD				
Location: JEBS			Date Started:9/1/98				
	Great Works Drilling	Total D	epth (ft)	:	15		
	ment: Mobile B59		o Bedro				
Drilling	g Method: Hollow Stem Auger		iameter		8		
Drilling	g Fluid: None		o Water		TBD		
Compl	letion: Completed as a Soil Vapor Extraction Well		By: P.				
	See Construction Log for details			•			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
_	0-15.5ft: Gravelly clayey silt: (ML), Lt olive gry				No samples required to be		
_	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation		
_	poorly sorted, subang to subrd.						
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15	15.5ft: Bedrock: Limestone.			ŀ			
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Projec	t Name: Loring AFB				Borehole No.: AEW-24	
Project Number: 22784 Elev			on:	TBD		
	on: JEBS	Date Started:9/1/98			Date Completed: 9/1/98	
	Great Works Drilling	Total Depth (ft): 8				
	nent: Mobile B59	Depth t	o Bedro	ck (ft).	8	
	Method: Hollow Stem Auger	Hole D	iameter	(in):	8	
	ı Fluid: None	Depth t	o Water	(ft):	TBD	
Compl	etion: Completed as a Soil Vapor Extraction Well	Logged	By: P.	Linley		
	See Construction Log for details			_		
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments	
_	0-8ft: Gravelly clayey silt: (ML), Lt olive gry				No samples required to be	
_	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation	
_	poorly sorted, subang to subrd.					
5	_					
"-	4					
	7#: Cobble zone					
-	7ft: Cobble zone.				Auger refusal at 7ft,	
	8ft: Bedrock: Limestone.				relocated approximately	
10			·		4ft west of oringinal	
l '°⊣	_				location.	
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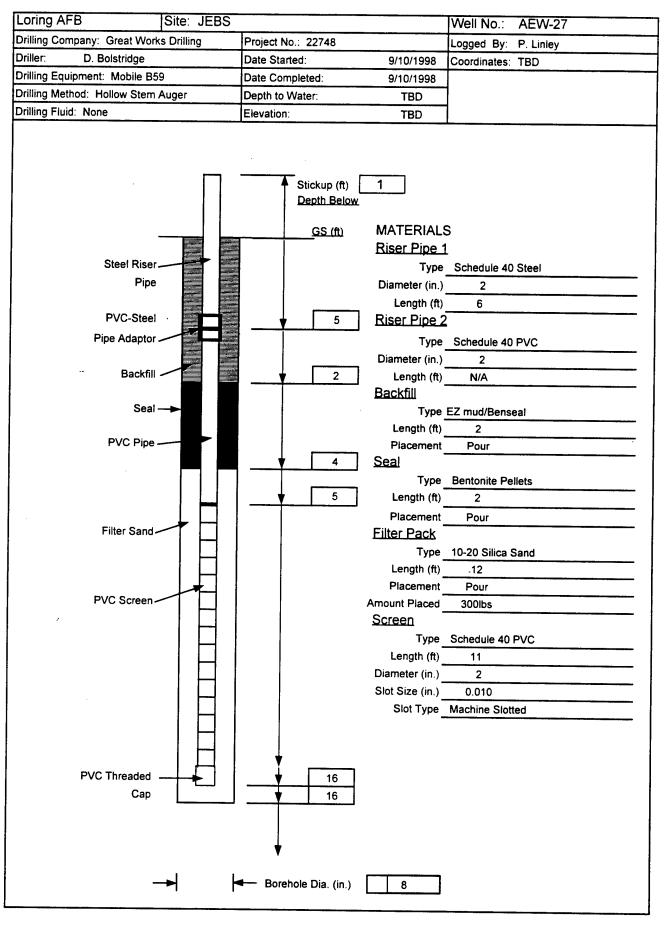
Project	Name: Loring AFB				Borehole No.: AEW-25
	Number: 22784	Elevation: TBD			
	on: JEBS	Date Started:9/1/98			Date Completed: 9/1/98
	Great Works Drilling		epth (ft):		12
	nent: Mobile B59		o Bedro		
	Method: Hollow Stem Auger		ameter (8
	Fluid: None		o Water		TBD
Compi	etion: Completed as a Soil Vapor Extraction Well	Logged	By: P.	Linley	
	See Construction Log for details				
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
	0-12ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, gvl to 6 inches in diameter. 5-5.5ft: Cobble zone.	Sar	Sar Typ	Blo	No samples required to be collected during installation
	- -				



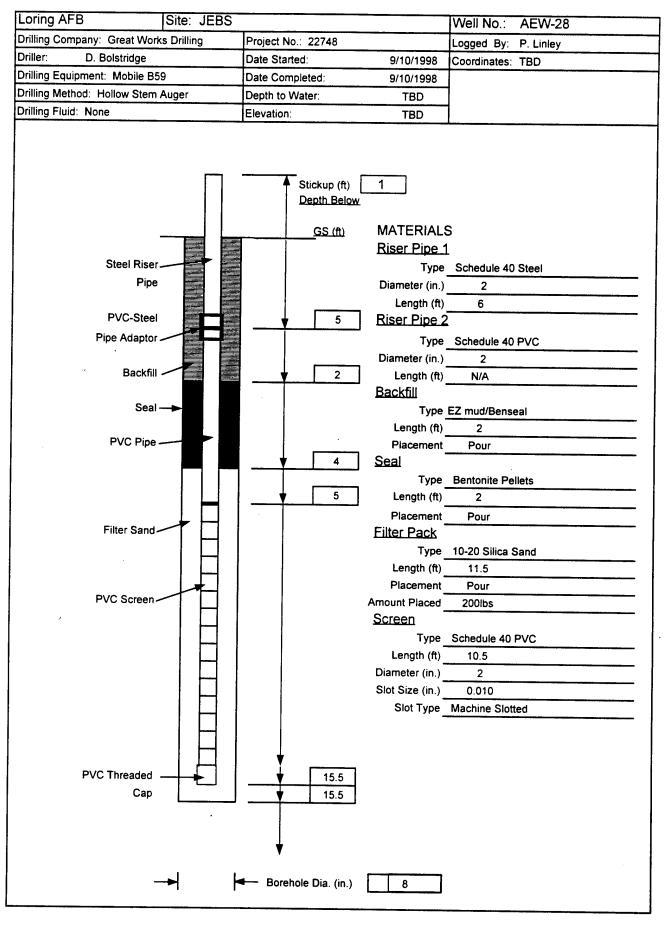
Project	t Name: Loring AFB				Borehole No.: AEW-26	
	t Number: 22784	Elevation: TBD				
	on: JEBS	Date Started:9/1/9			Date Completed: 9/1/98	
	Great Works Drilling		epth (ft):		15	
	nent: Mobile B59		o Bedro		15	
	Method: Hollow Stem Auger		iameter (8	
	Fluid: None		o Water		TBD	
Compl	etion: Completed as a Soil Vapor Extraction Well	Loggeo	By: P.	Linley		
	See Construction Log for details					
h (ft)	Description	ole Der	ele Sie	Blow Count	Comments	
Depth (ft)		Sample Number	Sample Type	Blow		
	0-0.5ft: Concrete				No samples required to be	
	0.5-1ft: Fill - Gravel				collected during installation	
_	1-15ft: Gravelly clayey silt: (ML), Lt olive gry					
	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid					
5_	poorly sorted, subang to subrd.					
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15	15ft: Bedrock: Limestone.					
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Proie	ct Name: Loring AFB				15
Project Number: 22784		Elevation: TBD			Borehole No.: AEW-39
	ion: JEBS	Elevation: TBD Date Started:9/3/98			
Driller: Great Works Drilling					Date Completed: 9/3/98
Equipment: Mobile B59			Pepth (ft		24
Drilling Method: Hollow Stem Auger		Depth to Bedrock (ft).			
	g Fluid: None	Hole Diameter (in):			8
	letion: Completed as a Soil Vapor Extraction Well	Depth to Water (ft): Logged By: P. Linley			TBD
	See Construction Log for details	Logged	1 By: P.	Linley	
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
	0-0.25ft: Asphalt				No samples required to be
_	0.25-0.75ft: Fill - Gravel		l		collected during installation
_	0.75-24ft: Gravelly clayey silt: (ML), Lt olive gry			ł	
5	(5Y6/4) to olive gry (5Y4/1), v fine to fine, unconsid				
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	24ft: Bedrock: Limestone.	į			•
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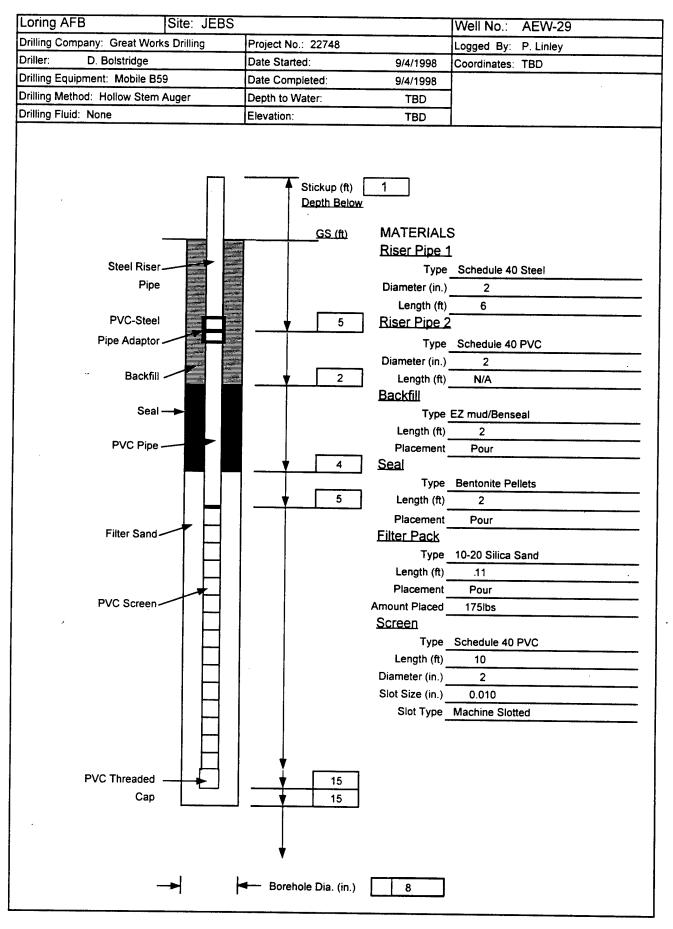
Projec	et Name: Loring AFB		· · ·		Borehole No.: AEW-27		
Project Number: 22784			Elevation: TBD				
Location: JEBS			Date Started:9/10/98 Date Completed: 9/10/98				
Driller: Great Works Drilling		Total Depth (ft): 16					
	Equipment: Mobile B59		to Bedro				
	g Method: Hollow Stem Auger	Hole D	Hole Diameter (in): 8				
	g Fluid: None	Depth to Water (ft):			TBD		
Comp	letion: Completed as a Soil Vapor Extraction Well	Logged By: P. Linley		Linley			
	See Construction Log for details						
Depth (ft)	Description	ple ober	ple e	Blow Count	Comments		
Dep		Sample Number	Sample Type	Blov			
_	0-0.6ft: Concrete				No samples required to be		
-	0.6-8ft: Fill - Gravel	}			collected during installation		
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-	8-16ft: Gravelly clayey silt: (ML), Lt olive gry				,		
-	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid						
10	poorly sorted, subang to subrd.						
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	16ft: Bedrock: Limestone.						
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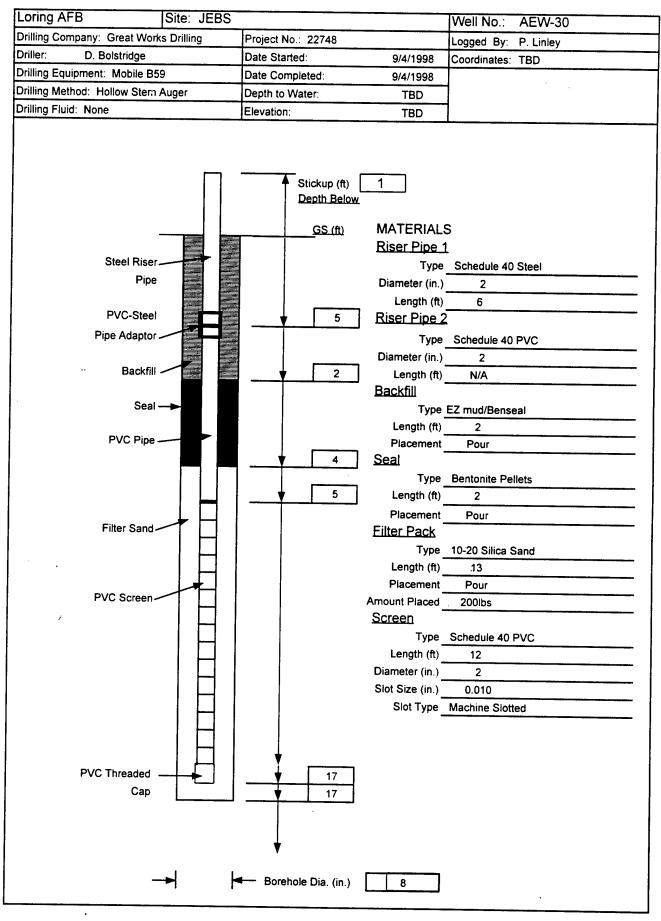
Projec	et Name: Loring AFB	· -			
Project Number: 22784		[[]			Borehole No.: AEW-28
	ion: JEBS	Elevation: TBD			
Driller: Great Works Drilling		Date Started:9/10/98			Date Completed: 9/10/98
Equipment: Mobile B59			epth (ft)		15.5
		Depth to Bedrock (ft)			15.5
	g Method: Hollow Stem Auger	Hole Diameter (in):			8
	g Fluid: None	Depth to Water (ft):			TBD
Comp	letion: Completed as a Soil Vapor Extraction Well	Logged By: P. Linley		Linley	
	See Construction Log for details				,
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
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-	0-0.25ft: Asphalt				No samples required to be
<u> </u>	0.25-1: Fill - Gravel				collected during installation
-	1-15.5ft: Gravelly clayey silt: (ML), Lt olive gry				
5-	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				
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15-	15 56: Badasalu I inc. 1				i
15_	15.5ft: Bedrock: Limestone.		1		İ
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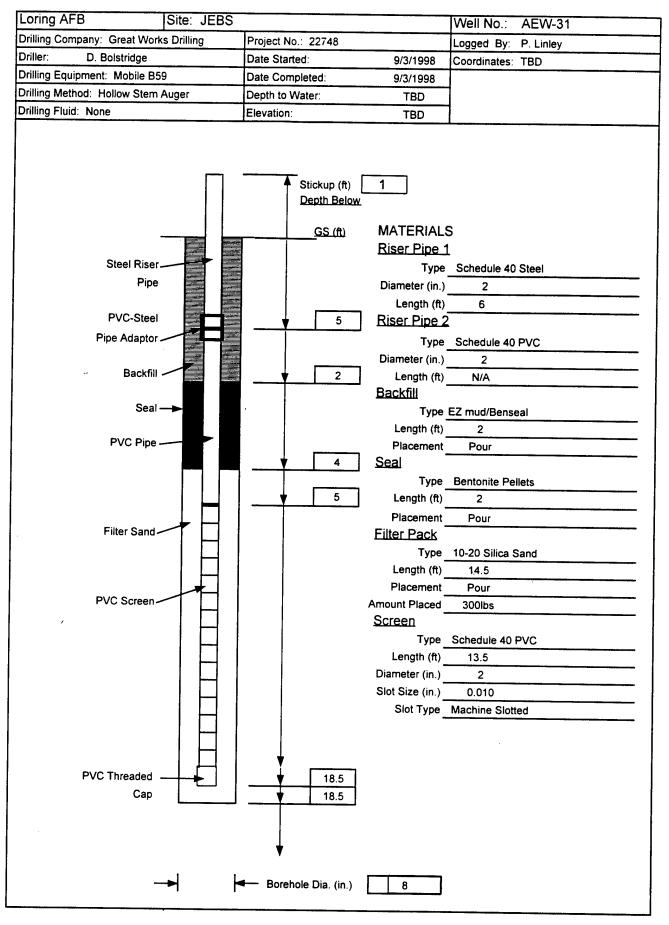
Proiec	t Name: Loring AFB	ī			Parahala Na : AFIA/ 00		
Project Number: 22784		Borehole No.: AEW-29 Elevation: TBD					
			Date Started:9/4/98 Date Completed: 9/4/98				
5.71							
			Total Depth (ft): 15 Depth to Bedrock (ft): 15				
			Hole Diameter (in): 8				
		Depth to Water (ft):			 TBD		
	letion: Completed as a Soil Vapor Extraction Well	Logged By: P. Linley					
	See Construction Log for details	209900					
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
_	0-1ft: Concrete				No samples required to be		
] -	1-13ft: Fill - Gravel				collected during installation		
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	13-15ft: Gravelly clayey silt: (ML), Lt olive gry			İ			
	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid						
15	poorly sorted, subang to subrd.						
	15ft: Bedrock: Limestone.			l			
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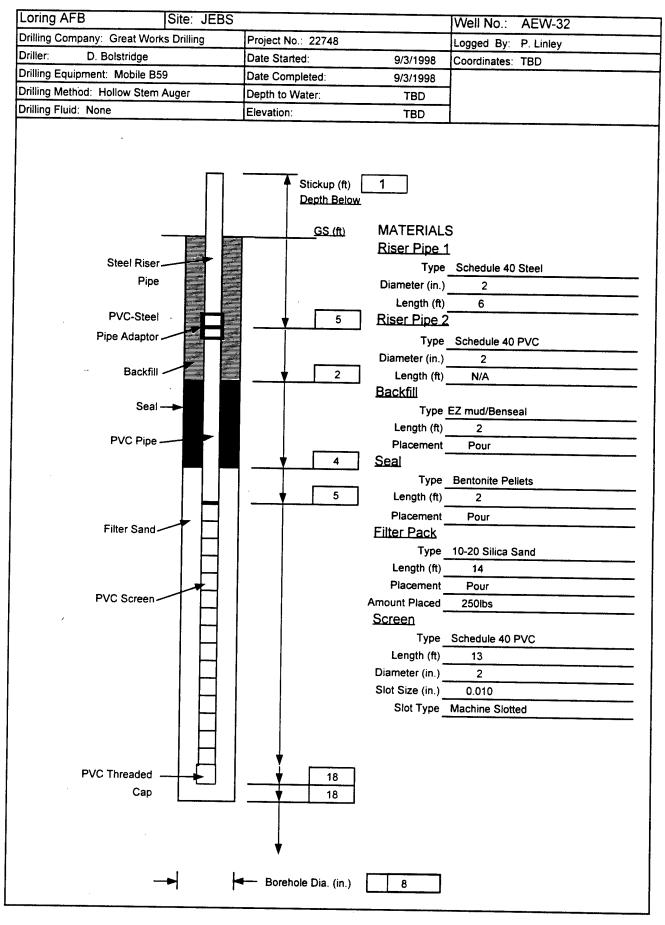
Projec	et Name: Loring AFB				Borehole No.: AEW-30	
Project Number: 22784		Elevation: TBD				
Location: JEBS		Date Started: 9/4/98 Date Completed: 9/4/98				
Driller: Great Works Drilling		Total Depth (ft):			17	
Equipment: Mobile B59			to Bedro			
	g Method: Hollow Stem Auger	Hole Diameter (in):			8	
	g Fluid: None	Depth to Water (ft):			TBD	
Compi	letion: Completed as a Soil Vapor Extraction Well	Logged By: P. Linley				
	See Construction Log for details					
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments	
_	0-1ft: Concrete				No samples required to be	
-	1-6ft: Fill - Gravel				collected during installation	
_	·					
5	-					
_	6-17ft: Gravelly clayey silt: (ML), Lt olive gry					
_	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid					
-	poorly sorted, subang to subrd.					
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_	17ft: Bedrock: Limestone.					
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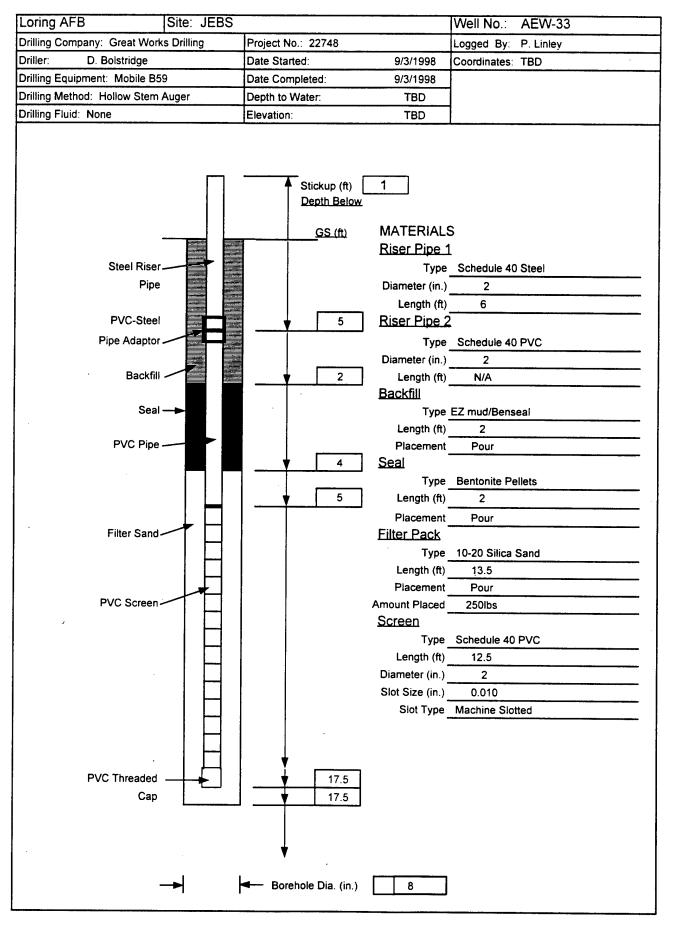
Proje	ct Name: Loring AFB			 	Developed Alexander	
Project Number: 22784		Borehole No.: AEM				
Location: JEBS		Date Started:9/3/98				
Driller: Great Works Drilling					Date Completed: 9/3/98	
Equipment: Mobile B59			Total Depth (ft): 18.5 Depth to Bedrock (ft): 18.5			
Drilling Method: Hollow Stem Auger						
	g Fluid: None	Hole Diameter (in): 8 Depth to Water (ft): TBD				
Comp	eletion: Completed as a Soil Vapor Extraction Well		oth to Water (ft): TBD ged By: P. Linley			
, ·	See Construction Log for details	Logged	г Бу. г.			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments	
10 1 20 1 30 1 30 1 30 1 30 1 30 1 30 1	0-18.5ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd. 18.5ft: Bedrock: Limestone.				No samples required to be collected during installation Relocated approximately 10ft east of original location to allow for rig access.	



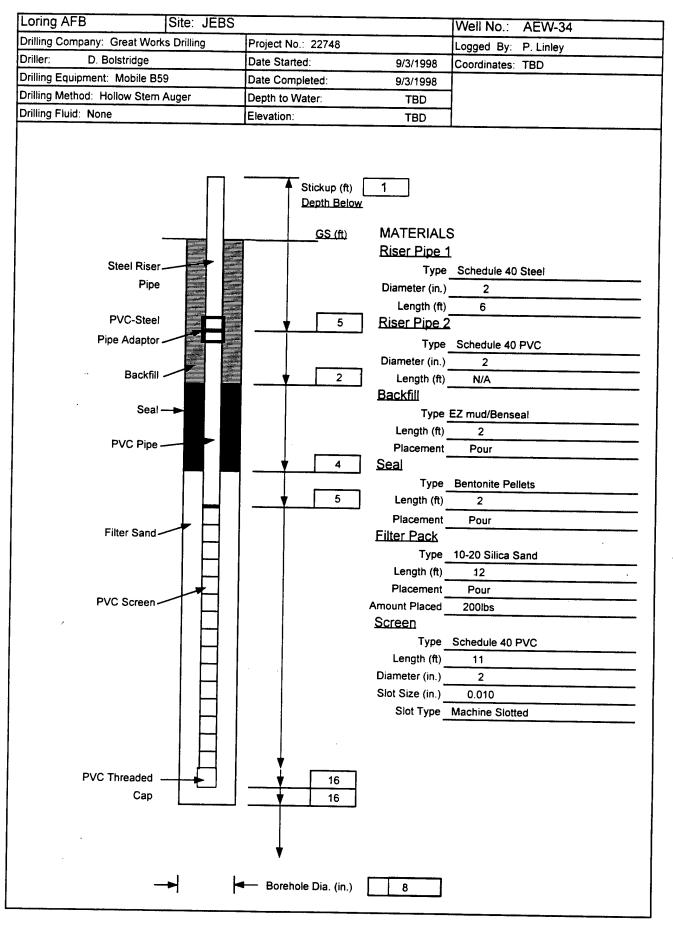
Projec	t Name: Loring AFB				Borehole No.: AEW-32		
Project Number: 22784		Elevation: TBD					
Location: JEBS			Date Started:9/3/98 Date Completed: 9/3/98				
Driller: Great Works Drilling			Total Depth (ft): 18				
Equipment: Mobile B59		Depth to Bedrock (ft)					
Drilling	Method: Hollow Stem Auger				8		
Drilling	Fluid: None		o Water		TBD		
Compl	etion: Completed as a Soil Vapor Extraction Well		Logged By: P. Linley				
	See Construction Log for details		_	_			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
	0-0.5ft: Concrete	0) 2	0 -	-Ш-	No samples required to be		
-	0.5-1ft: Fill - Gravel				collected during installation		
	1-18ft: Gravelly clayey silt: (ML), Lt olive gry				January Maring Matanation		
	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid						
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\vdash	18ft: Bedrock: Limestone.						
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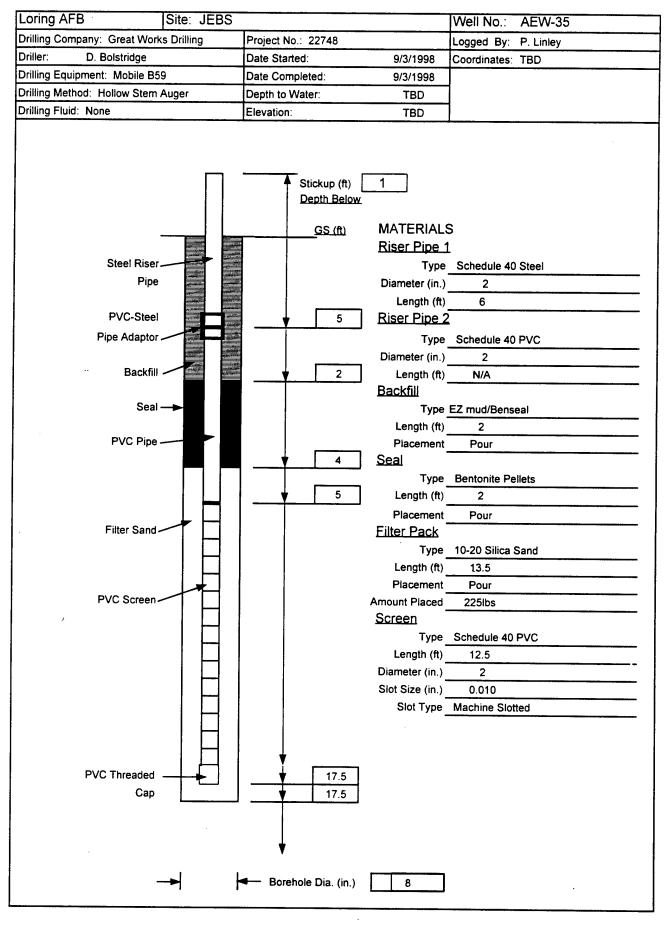
Projec	et Name: Loring AFB				Borehole No.: AEW-33		
Project Number: 22784			Elevation: TBD				
Location: JEBS			Date Started:9/3/98 Date Completed: 9/3/98				
	Great Works Drilling		epth (ft).		18.5		
	ment: Mobile B59		o Bedro				
	g Method: Hollow Stem Auger	Hole D	iameter ((in):	8		
	g Fluid: None		o Water		TBD		
Compi	letion: Completed as a Soil Vapor Extraction Well	Logged	IBy: P.	Linley			
	See Construction Log for details						
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
	0-0.5ft: Concrete		<u> </u>		No samples required to be		
_	0.5-1ft: Fill - Gravel				collected during installation		
-	1-18.5ft: Gravelly clayey silt: (ML), Lt olive gry				•		
5	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid						
"-	poorly sorted, subang to subrd.						
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	18.5ft: Bedrock: Limestone.			_			
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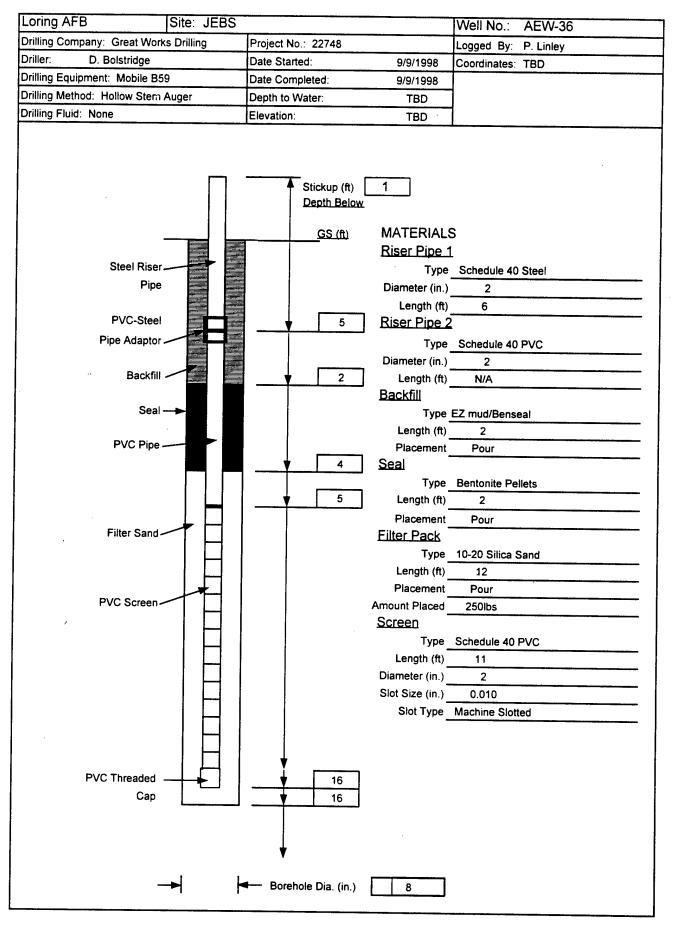
Proiec	et Name: Loring AFB				Borehole No.: AEW-34	
	et Number: 22784	Elevation: TBD				
	on: JEBS	Date Started:9/3/98			Date Completed: 9/3/98	
Driller.	: Great Works Drilling	Total Depth (ft): 16				
	ment: Mobile B59		to Bedro			
Drilling	g Method: Hollow Stem Auger		iameter		8	
	g Fluid: None		to Water	<u>`</u>	TBD	
Comp	letion: Completed as a Soil Vapor Extraction Well		By: P.			
	See Construction Log for details					
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments	
_	0-1ft: Concrete				No samples required to be	
_	1-2ft: Fill - Gravel				collected during installation	
-	2-16ft: Gravelly clayey silt: (ML), Lt olive gry					
5	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd.					
~-	poorly sorted, subang to subra.					
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	16ft: Bedrock: Limestone.					
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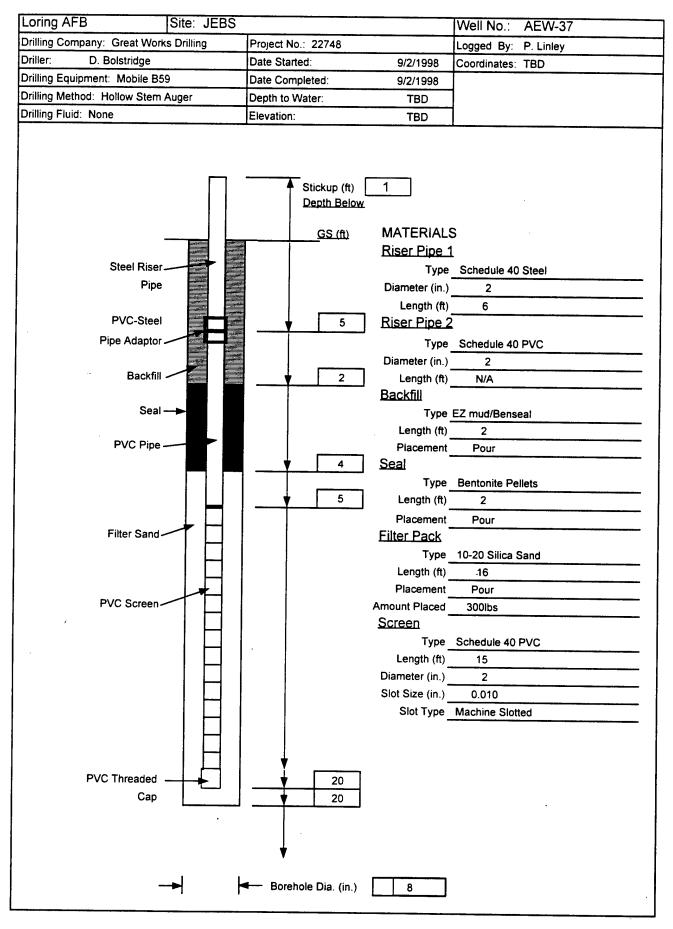
Projec	t Name: Loring AFB	i			Borehole No.: AEW-35		
			Elevation: TBD				
	on: JEBS	Date Started:9/3/98 Date Completed: 9/3/98					
	Great Works Drilling	Total Depth (ft): 17.5					
	ment: Mobile B59		o Bedro				
Drilling	Method: Hollow Stem Auger		iameter		8		
	g Fluid: None		o Water		TBD		
Compl	etion: Completed as a Soil Vapor Extraction Well		By: P.				
	See Construction Log for details						
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
 	0-17.5ft: Gravelly clayey silt: (ML), Lt olive gry	ΰZ	ığ −	В			
	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.				No samples required to be collected during installation		
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_	17.5ft: Bedrock: Limestone.			-			
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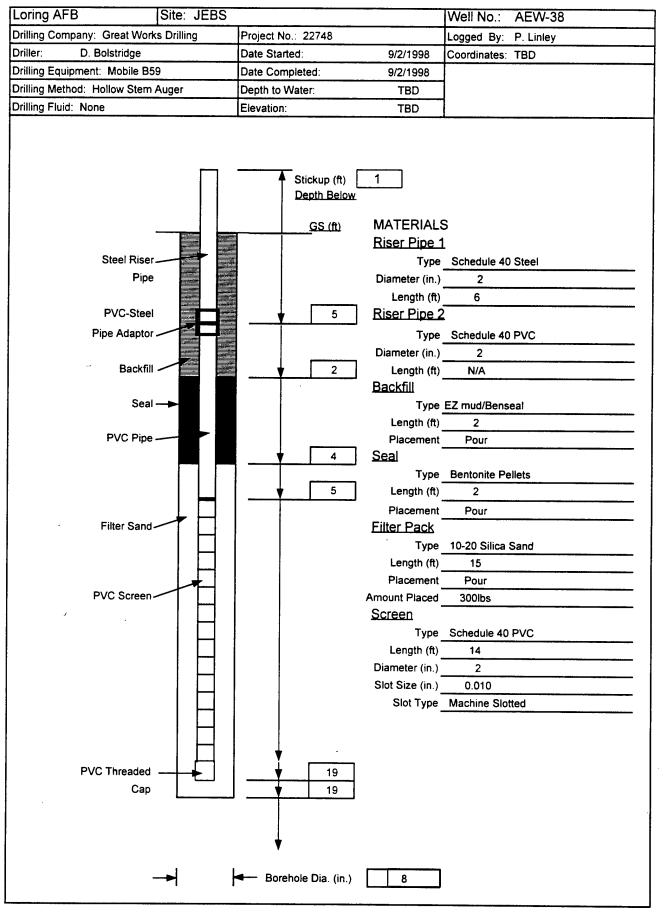
Projec	et Name: Loring AFB		-		Borehole No.: AEW-36		
Project Number: 22784			Elevation: TBD				
	on: JEBS	Date Started:9/9/98 Date Completed: 9/9/98					
Driller.	Great Works Drilling	Total D	16				
	ment: Mobile B59		o Bedro				
	g Method: Hollow Stem Auger		iameter		8		
	g Fluid: None		o Water		TBD		
Compl	letion: Completed as a Soil Vapor Extraction Well		By: P.				
	See Construction Log for details		•				
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
	0-16ft: Gravelly clayey silt: (ML), Lt olive gry				No samples required to be		
_	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation		
_	poorly sorted, subang to subrd.				-		
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	16ft: Bedrock: Limestone.						
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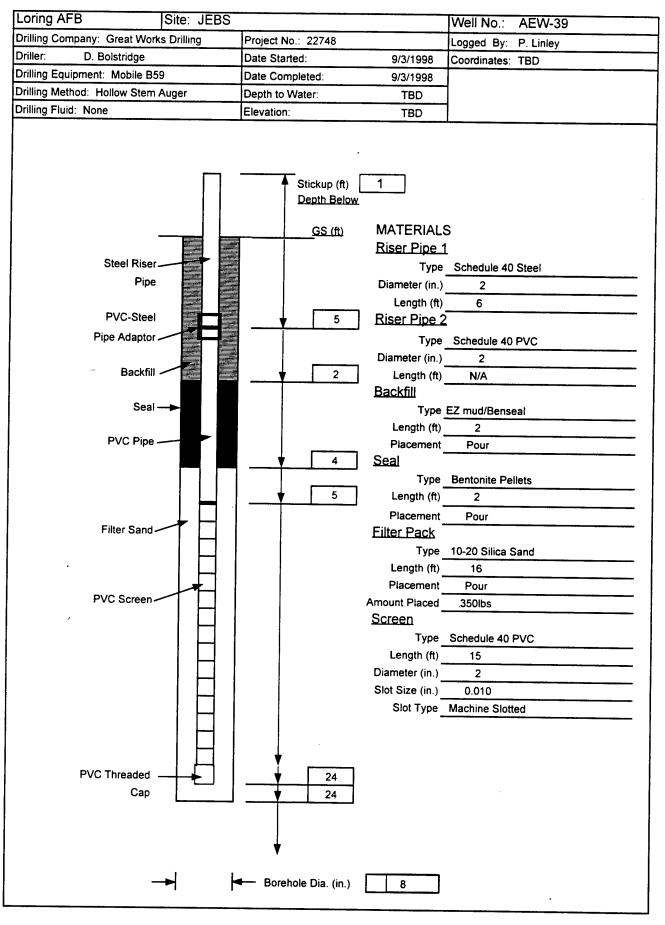
Projec	t Name: Loring AFB	<u> </u>			Borehole No.: AEW-37		
Project Number: 22784			Elevation: TBD				
Location: JEBS			Date Started:9/2/98 Date Completed: 9/2/98				
	Great Works Drilling	Total Depth (ft): 20					
	ment: Mobile B59		o Bedro		20		
	Method: Hollow Stem Auger		iameter		8		
	Fluid: None		o Water		TBD		
Compl	etion: Completed as a Soil Vapor Extraction Well	Logged	I By: P.	Linley			
	See Construction Log for details						
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
	0-20ft: Gravelly clayey silt: (ML), Lt olive gry				No samples required to be		
	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation		
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20	20ft Redrock: Limestone			ĺ			
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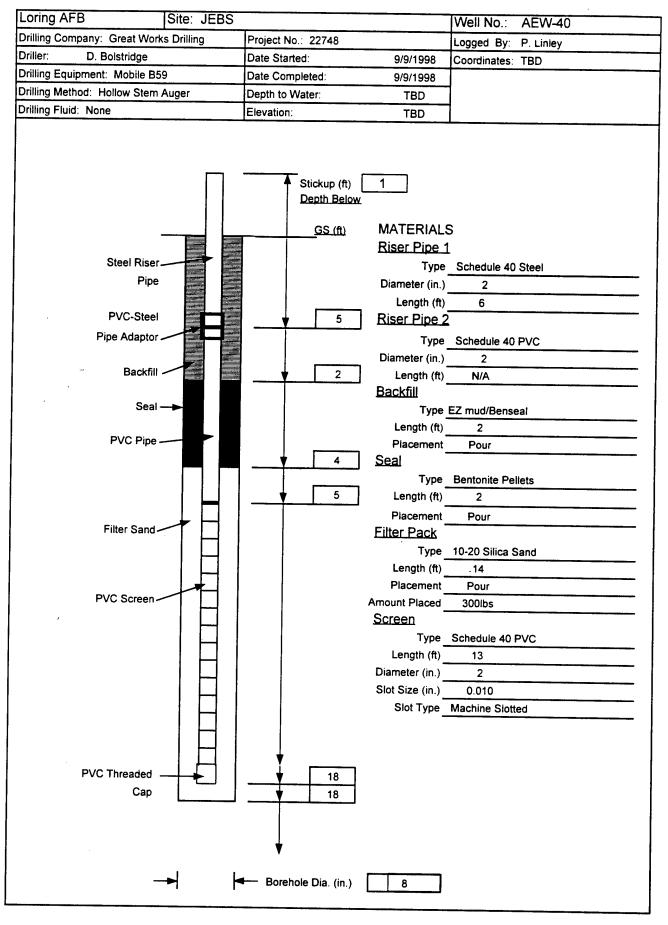
Projec	t Name: Loring AFB		· · · · · · · · · · · · · · · · · · ·		Borehole No.: AEW-38			
	Project Number: 22784			Elevation: TBD				
	on: JEBS	Date Started:9/2/98						
	Great Works Drilling	Total Depth (ft): 19						
	nent: Mobile B59	Depth	o Bedro	ck (ft):				
Drilling	n Method: Hollow Stem Auger	Hole D	iameter	(in):	8			
Drilling	r Fluid: None		o Water		TBD			
Compl	etion: Completed as a Soil Vapor Extraction Well	Logged	By: P.	Linley				
	See Construction Log for details			·				
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments			
_	0-19ft: Gravelly clayey silt: (ML), Lt olive gry				No samples required to be			
-	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation			
-	poorly sorted, subang to subrd.							
5	5ft: Moist.							
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_	19ft: Bedrock: Limestone.	ł	ļ					
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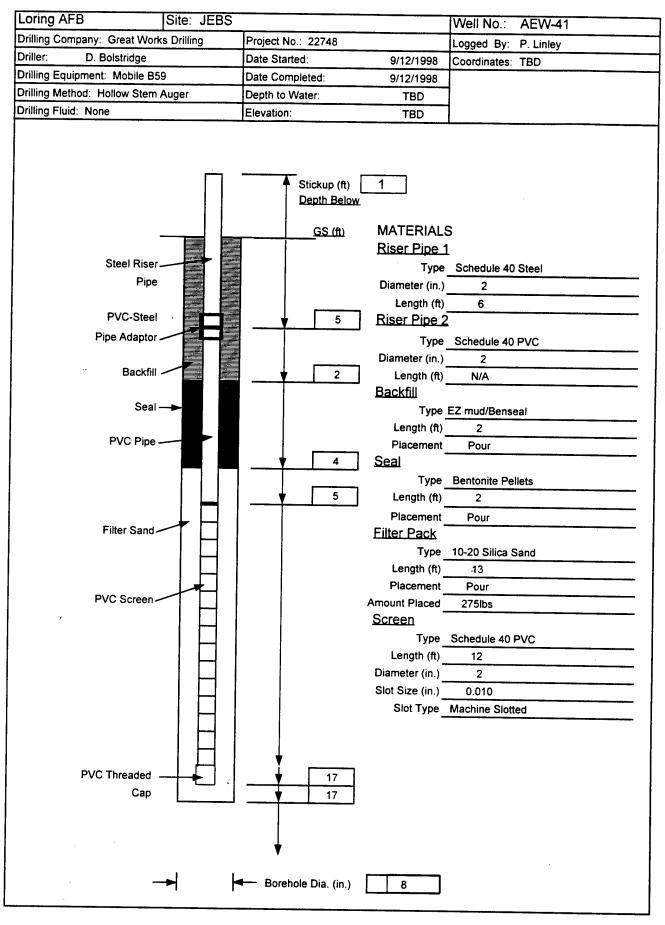
Projec	t Name: Loring AFB				Borehole No.: AEW-39		
	t Number: 22784	Elevati	on:	TBD	DOI ON OIC TO ALTV-05		
Locati	on: JEBS		ate Started:9/3/98 Date Completed: 9/3/98				
Driller.	Great Works Drilling	Total Depth (ft): 24					
	ment: Mobile B59		o Bedro				
Drilling	Method: Hollow Stem Auger		iameter		8		
	g Fluid: None		o Water		TBD		
	letion: Completed as a Soil Vapor Extraction Well		By: P.				
	See Construction Log for details	33					
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
_	0-0.25ft: Asphalt				No samples required to be		
_	0.25-0.75ft: Fill - Gravel				collected during installation		
-	0.75-24ft: Gravelly clayey silt: (ML), Lt olive gry						
5-	(5Y6/4) to olive gry (5Y4/1), v fine to fine, unconsid						
	poorly sorted, subang to subrd.						
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	24ft: Bedrock: Limestone.			ŀ	·		
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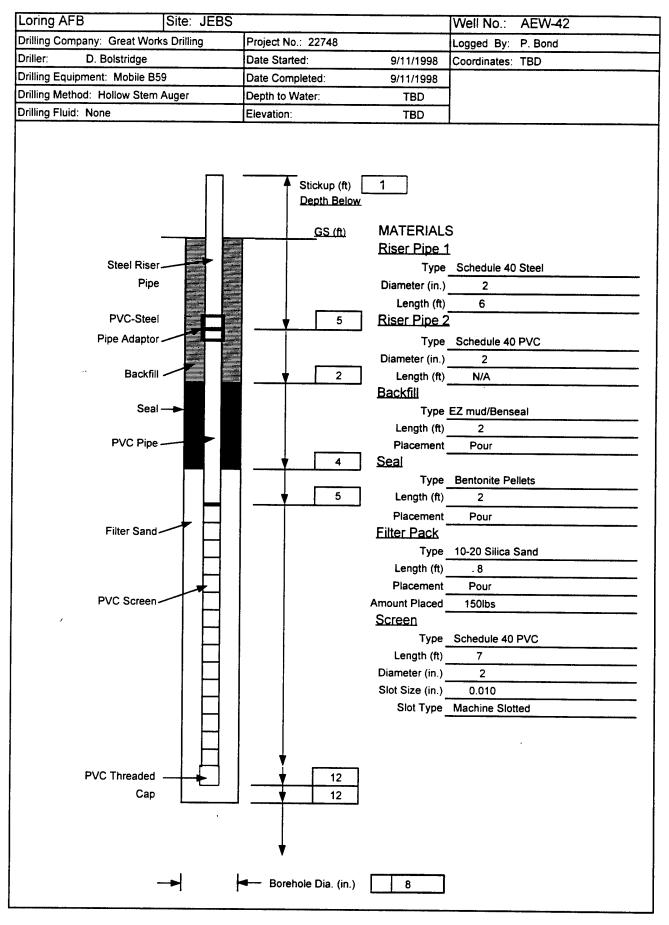
Projec	et Name: Loring AFB	T			Borehole No.: AEW-40		
Project Number: 22784			Elevation: TBD				
Location: JEBS			tarted:9	Date Completed: 9/9/98			
Driller.	Great Works Drilling	Total Depth (ft): 18					
	ment: Mobile B59		to Bedro				
Drilling	g Method: Hollow Stem Auger		iameter		8		
Drilling	g Fluid: None		to Water		TBD		
Comp	letion: Completed as a Soil Vapor Extraction Well		By: P.				
	See Construction Log for details						
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
_	0-18ft: Gravelly clayey silt: (ML), Lt olive gry				No samples required to be		
_	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld				collected during installation		
-	poorly sorted, subang to subrd.				·		
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_	8ft: V moist to wet.			İ	ļ		
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ΙĦ	12ft: Clay fraction increase to 15%.	·		ĺ			
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	18ft: Bedrock: Limestone.	ŀ		-			
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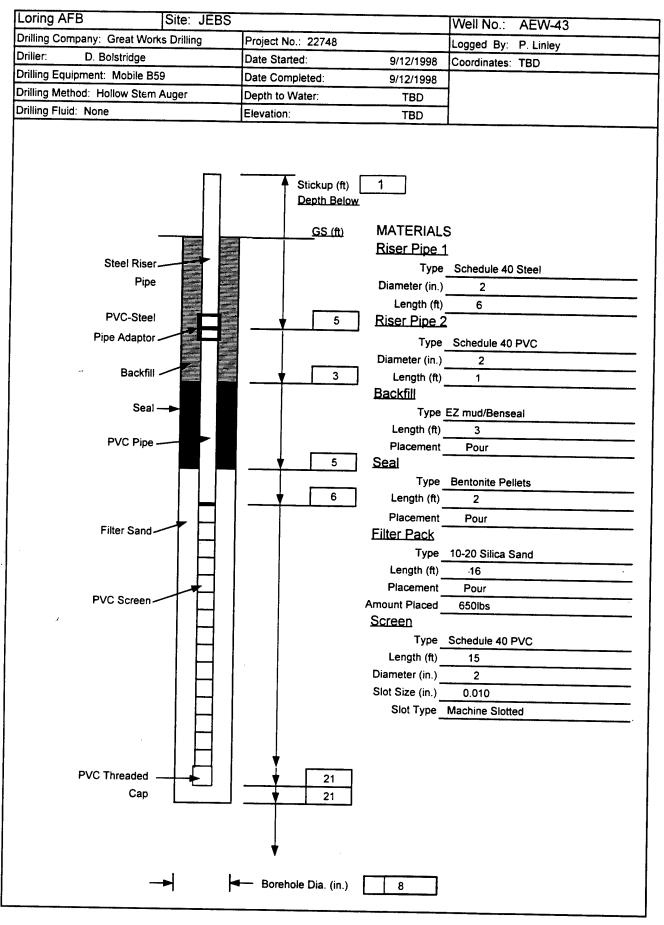
Projec	t Name: Loring AFB	l .		· · · · · ·	Borehole No.: AEW-41		
Project Number: 22784			Elevation: TBD				
Location: JEBS			Date Started:9/12/98 Date Completed: 9/12/98				
	Great Works Drilling	Total Depth (ft): 17					
	ment: Mobile B59		o Bedro		17		
Drilling	n Method: Hollow Stem Auger		iameter		8		
	r Fluid: None	Depth t	o Water	(ft):	TBD		
Compl	etion: Completed as a Soil Vapor Extraction Well	Logged	By: P.	Linley			
	See Construction Log for details			,	-		
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
	0-17ft: Gravelly clayey silt: (ML), Lt olive gry				No samples required to be		
_	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation		
_	poorly sorted, subang to subrd.						
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-	17ft: Bedrock: Limestone.			ľ			
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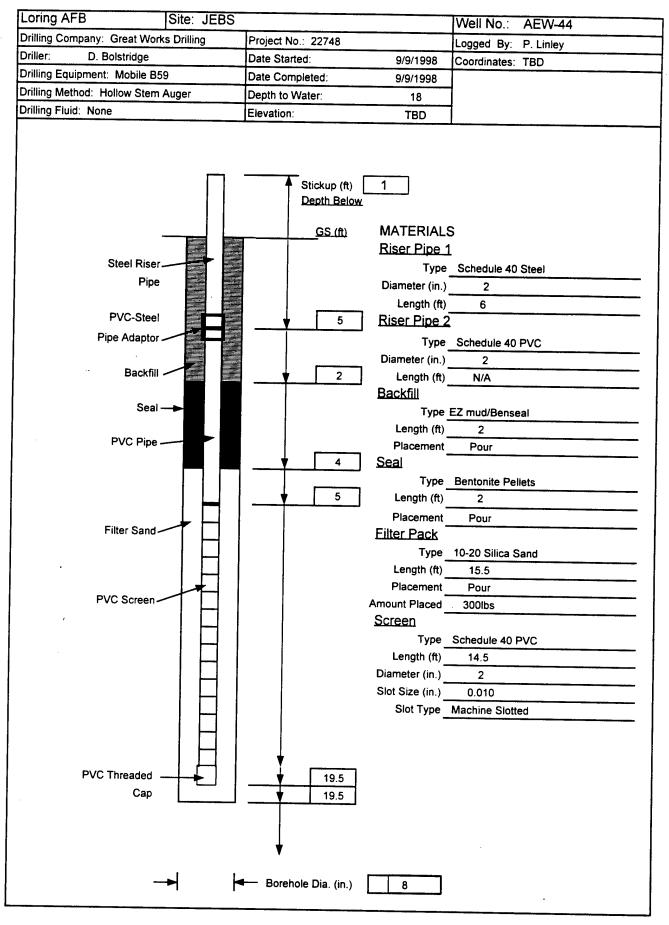
Proiec	t Name: Loring AFB	T			Donahala Na . AFIM 40		
	t Number: 22784	Borehole No.: AEW-42 Elevation: TBD					
Location: JEBS			Elevation: TBD Date Started: 9/11/98 Date Completed: 9/11/98				
	Great Works Drilling						
	ment: Mobile B59		to Bedro		12		
	Method: Hollow Stem Auger		iameter				
	g Fluid: None		to Water		8		
	letion: Completed as a Soil Vapor Extraction Well		By: P.		TBD		
	See Construction Log for details	Logget	г Бу. Р.	БОПа			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
_	0-12ft: Gravelly silt/clay w/sand: (ML), olive gry				No samples required to be		
-	(5Y4/1), gravels , 1cm mostly rounded, Larger				collected during installation		
-	ones mostly angular, moist to dry soils, w/depth						
5	color becomes intermingeld w/mod olive brn (5Y4/4).						
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	12ft: Bedrock: Limestone.						
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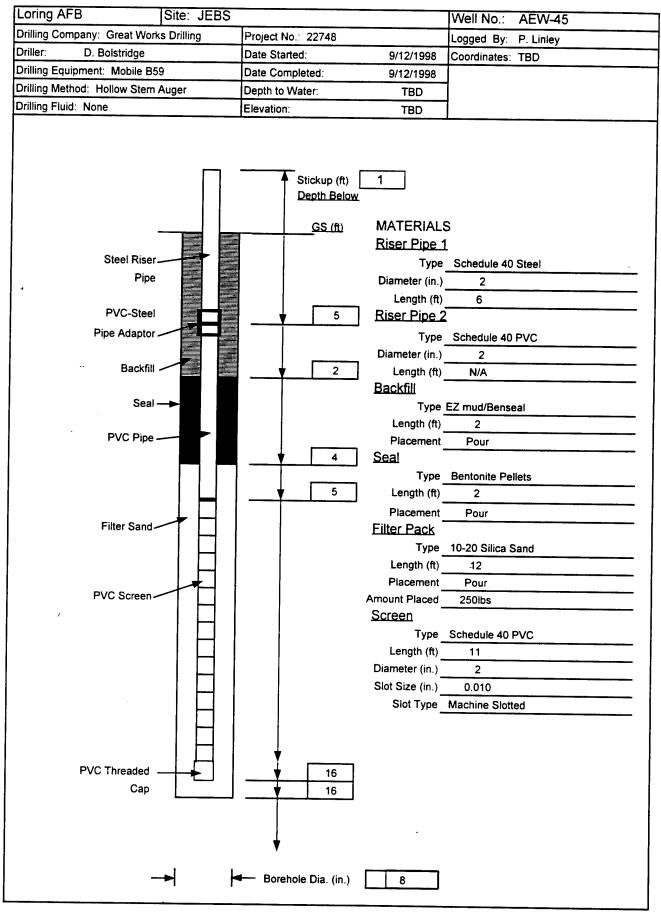
Projec	et Name: Loring AFB				10			
			Borehole No.: AEW-43 Elevation: TBD					
	Location: JEBS							
	Great Works Drilling		Date Completed: 9/2/98					
	ment: Mobile B59		epth (ft)		21			
	g Method: Hollow Stem Auger		to Bedro					
	g Fluid: None		iameter	<u> </u>	8			
Compl	letion: Completed as a Soil Vapor Extraction Well		to Water		TBD			
	See Construction Log for details	Logget	l By: P.	Liniey				
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments			
_	0-21ft: Gravelly clayey silt: (ML), Lt olive gry				No samples required to be			
-	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation			
-	poorly sorted, subang to subrd.							
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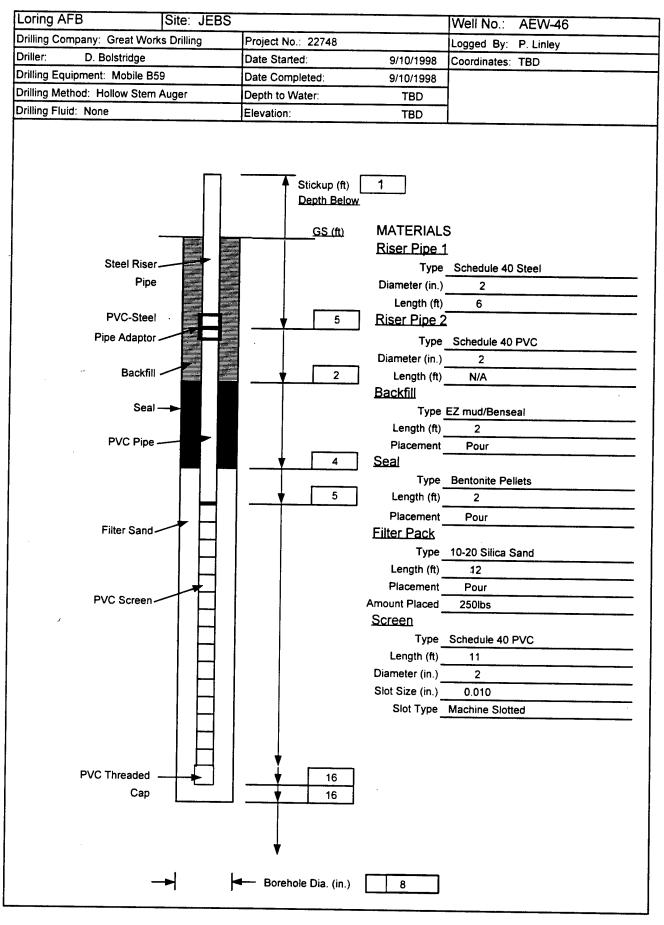
Projec	t Name: Loring AFB	T			Borehole No.: AEW-44		
Project Number: 22784			Elevation: TBD				
	on: JEBS	Date Started:9/9/98			Date Completed: 9/9/98		
Driller.	Great Works Drilling		epth (ft)		19.5		
Equipi	ment: Mobile B59	-	to Bedro				
Drilling	Method: Hollow Stem Auger		iameter		8		
	g Fluid: None		o Water	<u> </u>	18		
Comp	letion: Completed as a Soil Vapor Extraction Well		By: P.				
	See Construction Log for details			,			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
	0-0.25ft: Asphalt				No samples required to be		
_	0.25-0.75ft: Fill - Gravel		1		collected during installation		
_	0.75-19.5ft: Gravelly clayey silt: (ML), Lt olive				-		
	gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly				,		
5_	sorted, unconsid, subang to subrd, moist.		!				
_	3ft:- Moist to v moist.						
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-	18ft: Wet - soupy cuttings.			-			
_	19.5ft: Bedrock: Limestone.						
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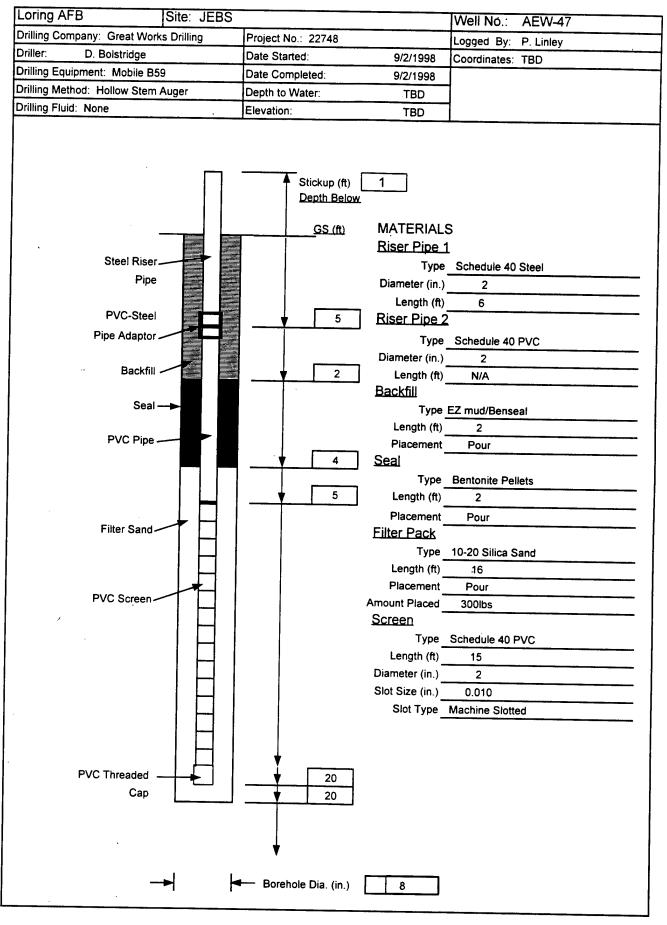
Projec	et Name: Loring AFB	T			Borehole No : AEM 45		
Project Number: 22784			Borehole No.: AEW-45 Elevation: TBD				
Location: JEBS			Date Started:9/12/98 Date Completed: 9/12/98				
Driller: Great Works Drilling		Total D	epth (ft)	:	16		
	ment: Mobile B59		to Bedro				
Drilling	g Method: Hollow Stem Auger	Hole Diameter (in):			8		
Drilling	g Fluid: None	Depth to Water (ft):			TBD		
Compl	letion: Completed as a Soil Vapor Extraction Well		By: P.				
	See Construction Log for details		T	,			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
-	0-16ft: Gravelly Clayey Silt: (ML), Lt olive gry				No samples required to be		
-	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation		
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15	16th Badrack, Live						
_	16ft: Bedrock: Limestone.		l				
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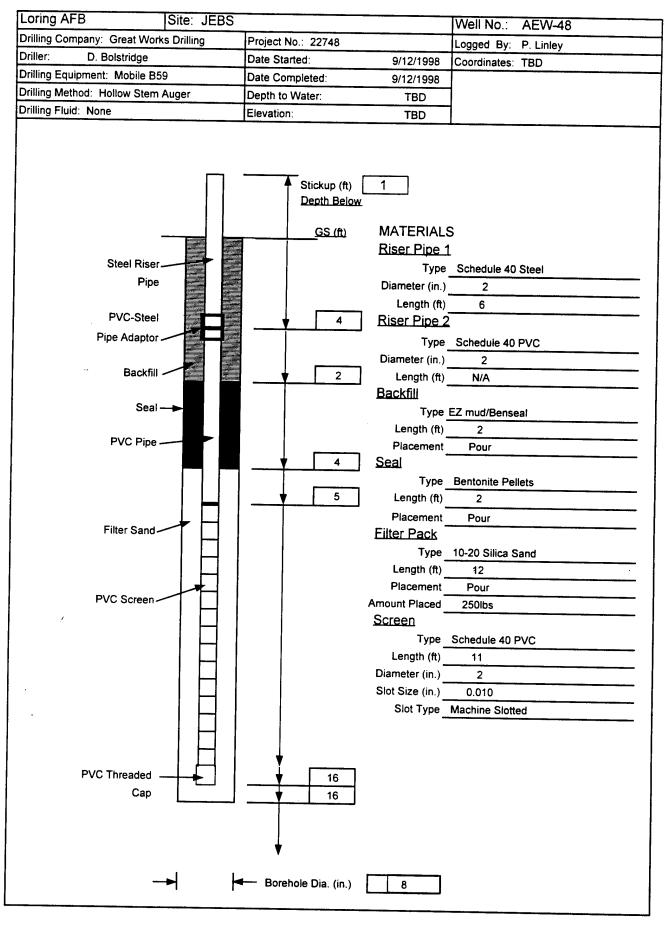
Projec	et Name: Loring AFB	T			In the second		
Project Number: 22784			Borehole No.: AEW-46 Elevation: TBD				
			Date Started:9/10/98 Date Completed: 9/10/98				
	ment: Mobile B59	Total Depth (ft):			16		
	g Method: Hollow Stem Auger	Depth to Bedrock (ft).					
	g Fluid: None	Hole Diameter (in):			8		
	letion: Completed as a Soil Vapor Extraction Well	Depth to Water (ft): Logged By: P. Linley			TBD		
	See Construction Log for details	Logged	гву: Р.	Liniey	l		
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
] _	0-16ft: Gravelly Clayey Silt: (ML), Lt olive gry				No samples required to be		
_	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation		
_	poorly sorted, subang to subrd.						
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	16ft: Bedrock: Limestone.	İ		ł	·		
	Total Dealer Enricatoric.	ŀ		Į			
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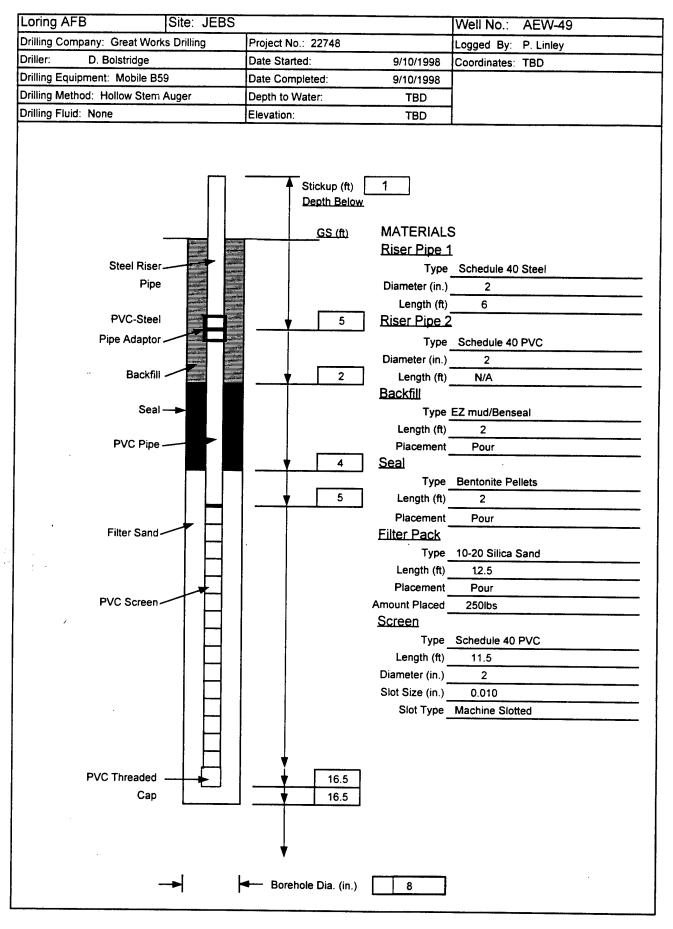
Projec	t Name: Loring AFB				Borehole No.: AEW-47	
Project Number: 22784		Elevation: TBD				
	on: JEBS		tarted:9/		Date Completed: 9/2/98	
Driller:	Great Works Drilling		epth (ft)		20	
	ment: Mobile B59		o Bedro			
Drilling	Method: Hollow Stem Auger		iameter		. 8	
	Fluid: None		o Water		TBD	
Compi	etion: Completed as a Soil Vapor Extraction Well		I By: P.			
	See Construction Log for details		·	T - · · · · · · · · · · · · · · · · · ·		
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments	
_	0-20ft: Gravelly Clayey Silt: (ML), Lt olive gry				No samples required to be	
_	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation	
	poorly sorted, subang to subrd, moist.					
5	<u> </u>					
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_	7-7.5ft: Cobble zone.					
_	7-7.5it. Cobbie zone.					
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20	20ft: Bedrock: Limestone.					
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Projec	et Name: Loring AFB	 			15
		Claurati		TDD	Borehole No.: AEW-48
Project Number: 22784 Location: JEBS		Elevation: TBD			
Driller: Great Works Drilling					Date Completed: 9/12/98
			epth (ft)		16
	ment: Mobile B59		o Bedro		
	Method: Hollow Stem Auger	Hole Diameter (in):			8
	g Fluid: None	Depth to Water (ft):			TBD
Compi	letion: Completed as a Soil Vapor Extraction Well	Logged	By: P.	Linley	
	See Construction Log for details				
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1	Description	현현	e e	}	Comments
Depth (ft)		Sample Number	Sample Type	Blow Count	
	0-16ft: Gravelly Clayey Silt: (ML), Lt olive gry	0, 2	0, [No samples required to be
-	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation
	poorly sorted, subang to subrd.				osilotod daring installation
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· · -	16ft: Bedrock: Limestone.				ĺ
_	Total Bedrock. Limestone.				
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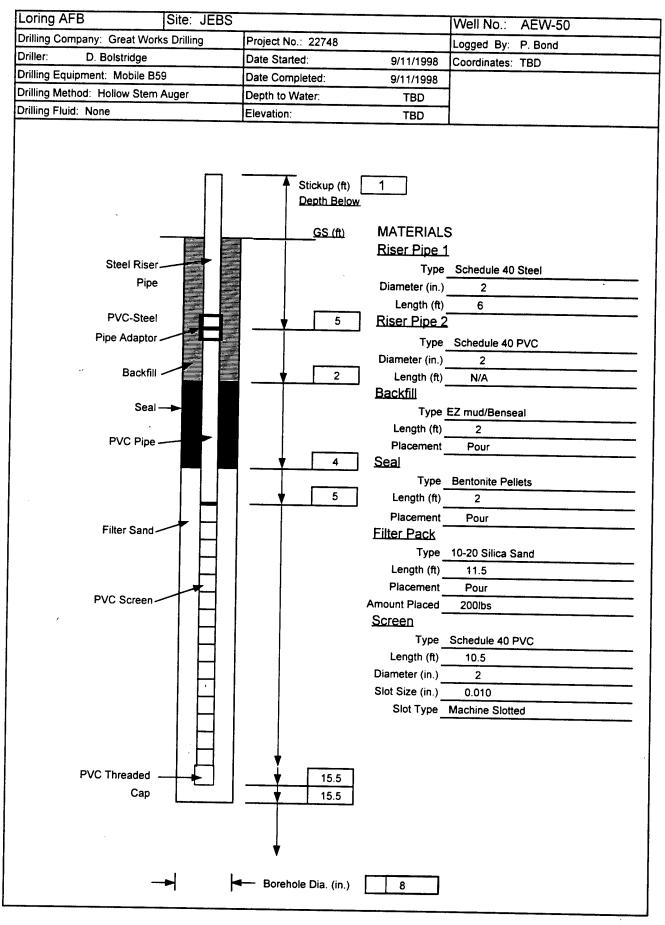


Projec	t Name: Loring AFB		······································		Borehole No.: AEW-49		
Project Number: 22784			Elevation: TBD				
Location: JEBS		Date Started:9/10/98 Date Completed: 9/10/98					
Driller: Great Works Drilling		Total Depth (ft):			16.5		
Drilling	g Method: Hollow Stem Auger	Depth to Bedrock (ft). Hole Diameter (in):			8		
	g Fluid: None	Depth to Water (ft):			3		
Compi	letion: Completed as Soil Vapor Extraction Well	Logged By: P. Linley					
	See Construction Log for details						
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
-	0-10ft: Fill - Gravel: Moist.				No samples required to be		
-	3ft: Wet.				collected during installation		
-	Joil. Vvel.						
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10	10-16.5ft: Gravelly Clayey Silt: (<i>ML</i>), Lt olive gry						
"-	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid			İ			
-	poorly sorted, subang to subrd.]			
	- Subjective of the subjective			Ì	İ		
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-	16.5ft: Bedrock: Limestone.		ł	1			
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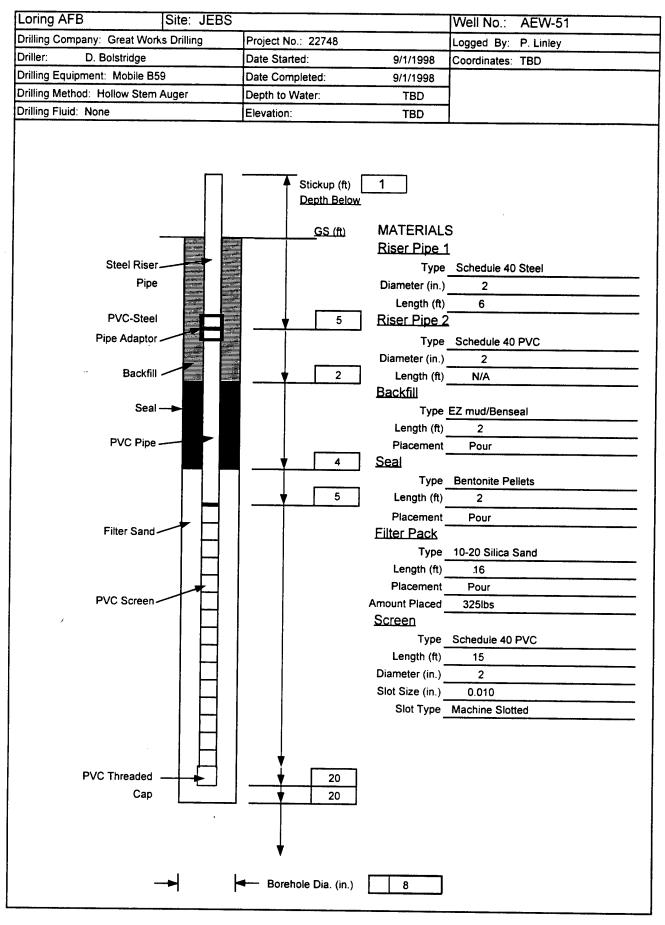
Project Name: Loring AFB			Developed No. ACM 50		
Project Number: 22784	Flova	Borehole No.: AEW-50 Elevation: TBD			
			/98 Date Completed: 9/11/98		
Driller: Great Works Drilling		Depth (ft):	15.5		
Equipment: Mobile B59		to Bedrock			
Drilling Method: Hollow Stem Auger		Diameter (in)	<u> </u>		
Drilling Fluid: None		to Water (ft)			
Completion: Completed as Soil Vapor Extraction		d By: P. Bo			
See Construction Log for details	Logge		nd -		
Description (#)	Sample	Sample Type			
0-15.5ft: Gravelly silty clay w/sand: (A	<i>1L</i>), Lt	1.	No samples required to be		
olive brn (5Y5/6), gravels to 4cm, mostly	rounded]		collected during installation		
10 1 15 15.5ft: Bedrock: Limestone.					

SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG



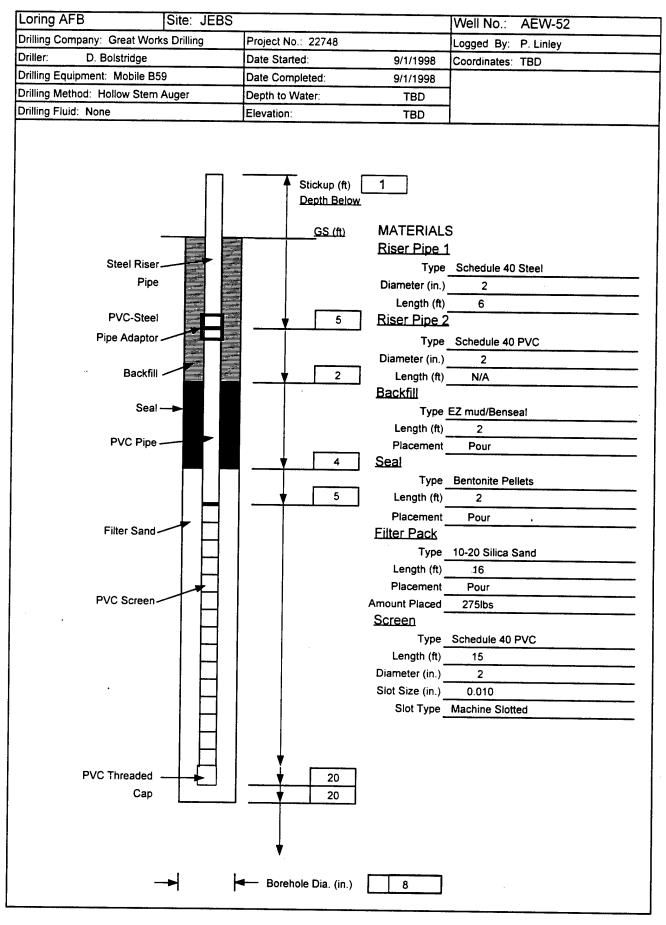
Projec	t Name: Loring AFB	T T			Borehole No.: AEW-51	
Project Number: 22784 Elev			on:	TBD	Dordroid Wo., ALVV-01	
Location	on: JEBS	Date Started:9/1/98 Date Completed: 9/1/98				
	Great Works Drilling	Total Depth (ft): 20				
	ment: Mobile B59	Depth t	o Bedro	ck (ft):	20	
	Method: Hollow Stem Auger	Hole D	iameter	(in):	8	
	g Fluid: None	Depth t	o Water	(ft):	TBD	
Compl	etion: Completed as Soil Vapor Extraction Well	Logged	I By: P.	Linley		
	See Construction Log for details			r		
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments	
l _	0-20ft: Gravelly clayey silt: (ML), Lt olive gry				No samples required to be	
_	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid_]	1		collected during installation	
] _	poorly sorted, subang to subrd.					
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~-	6ft: Moist.					
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-	8ft: V moist.					
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20_	20ft: Bedrock: Limestone.					
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SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

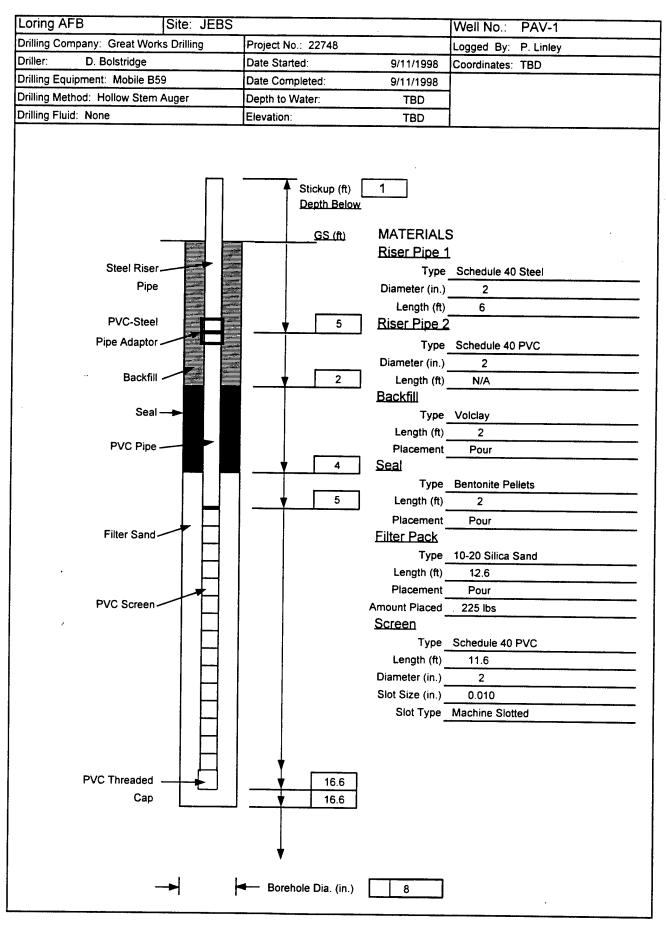


Projec	et Name: Loring AFB	1			Borehole No.: AEW-52
				TBD	Boreffole IVO AEVV-52
	ocation: JEBS Date Started:9/1/9				Date Completed: 9/1/98
Driller.	Great Works Drilling	Total D	20		
	ment: Mobile B59		o Bedro		
	Method: Hollow Stem Auger		iameter		8
	r Fluid: None		o Water		TBD
Comp	letion: Completed as Soil Vapor Extraction Well		By: P.		
	See Construction Log for details	33			·
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
] _	0-20ft: Gravelly silty clay w/sand: (ML), Lt				No samples required to be
_	olive brn (5Y5/6), gravels to 4cm, mostly rounded				collected during installation
-	edges. 4-6ft: Cobble zone.				
5	14-ort. Cobble zone.				
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_	8-8.5ft: Cobble zone.				İ
	o-o.or. Copple zone.			j	
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20	20ft: Bedrock: Limestone.		·		
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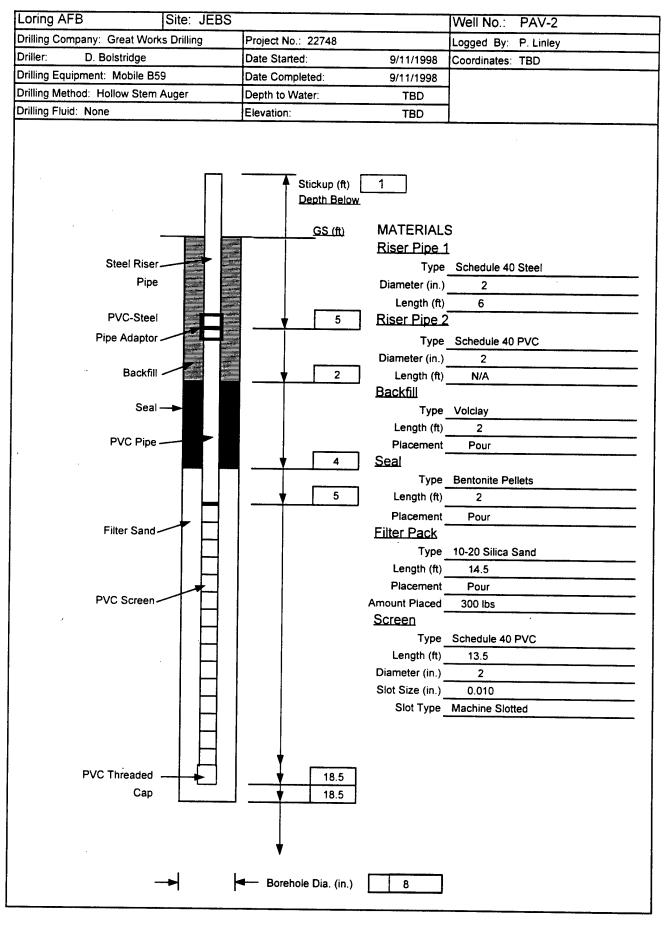
SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG



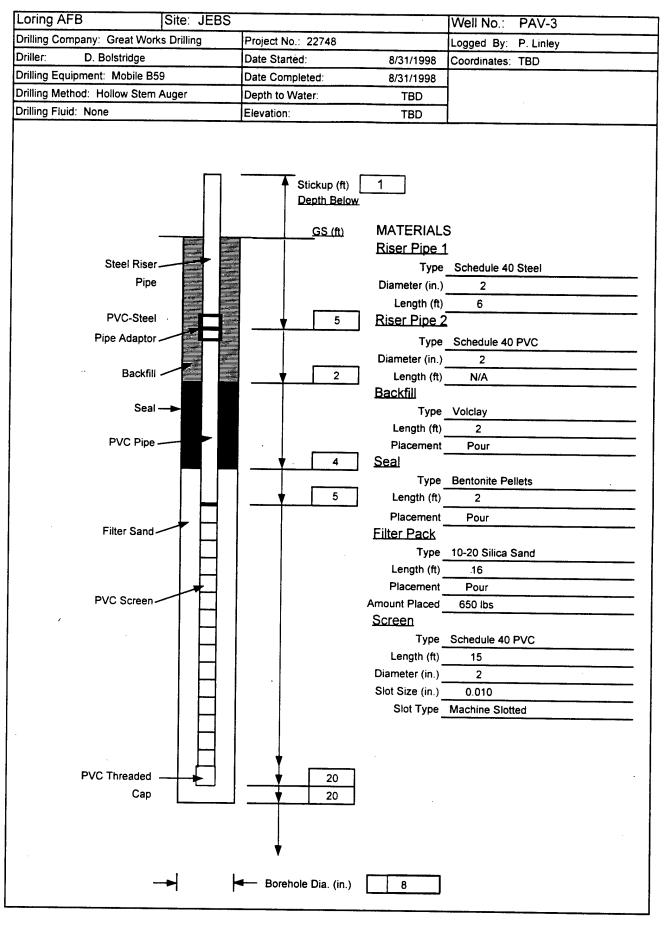
Proje	ct Name: Loring AFB	Т			Borehole No.: PAV-1		
	ct Number: 22784	Elevation: TBD					
	ion: JEBS	Date Started:9/11/98 Date Completed: 9/11/98					
Drillei	r: Great Works Drilling	Total Depth (ft): 15.6					
	ment: Mobile B59		to Bedro				
Drillin	g Method: Hollow Stem Auger		iameter		8		
	g Fluid: None		to Water		TBD		
Comp	eletion: Completed as a Passive Air Vent		By: P.				
	See Construction Log for details			·			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
10 1 20 25 1 30 1 30 1	0-0.25ft: Asphalt 0.25-0.75ft: Fill - Gravel 0.75-15.6ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld, poorly sorted, subang to subrd.		5)		No samples required for collection. Auger refusal at 3ft BGL, relocated approx. 3ft south southeast of original location.		



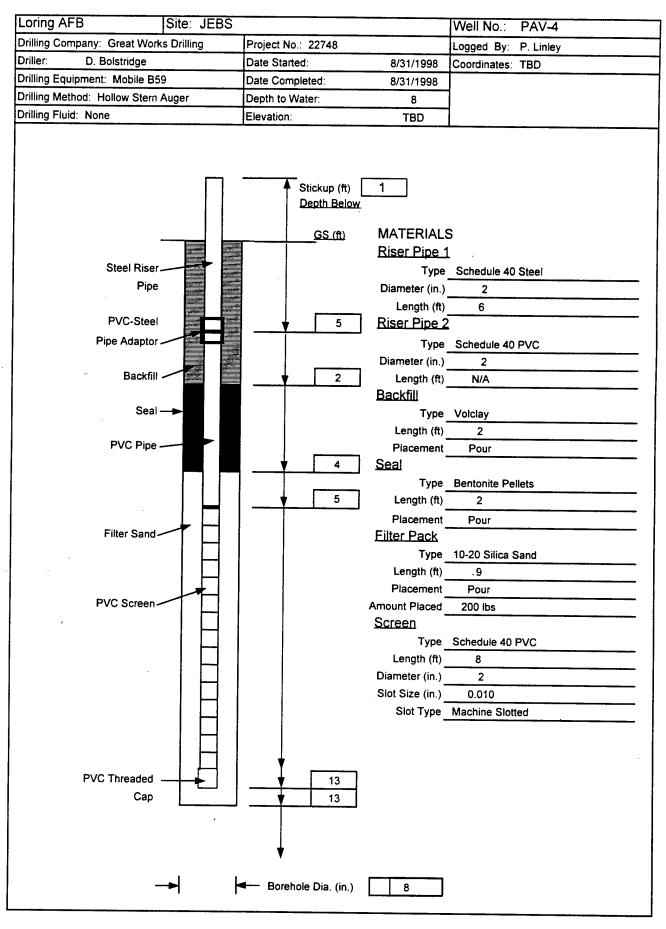
Proiec	t Name: Loring AFB	1			Pombolo No - DAV 0
	t Number: 22784	Elevati	on:	TBD	Borehole No.: PAV-2
	on: JEBS				Data Completed: 0/44/00
	Great Works Drilling	Total D	Date Completed: 9/11/98 18.5		
	ment: Mobile B59				
	g Method: Hollow Stem Auger		o Bedro		
	g Fluid: None		iameter		8
	letion: Completed as a Passive Air Vent		o Water		TBD
	See Construction Log for details	Logged	I By: P.	Liniey	
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
10 1	0-0.25ft: Asphalt 0.25-0.75ft: Fill - Gravel 0.75-18.5ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld, poorly sorted, subang to subrd.	0) 2	I .		No samples required for collection.



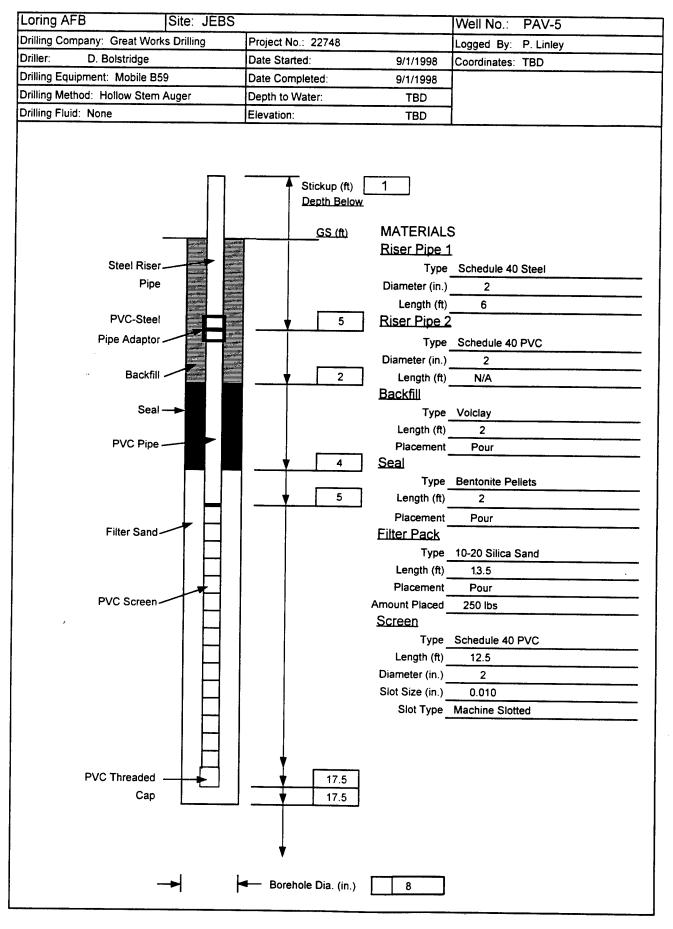
Proied	ct Name: Loring AFB	T			15				
			Borehole No.: PAV-3 Elevation: TBD						
	1 (1)								
-	: Great Works Drilling	Date Started:8/31/98 Date Completed: 8/3 Total Depth (ft): 20							
	ment: Mobile B59				20				
	g Method: Hollow Stem Auger		to Bedro iameter						
	g Fluid: None				8				
	letion: Completed as a Passive Air Vent		to Water I By: P.		TBD				
	See Construction Log for details	Logget	г Бу. Р.	Liney					
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments				
-	0-20ft: Gravelly Clayey Silt: (ML), Lt olive gry				No samples required for				
-	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collection.				
-	poorly sorted, subang to subrd, gvl 4-5 inches in diameter.								
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_	8ft: Clay fraction increase to 20%.				ļ				
_	9ft: Clay fraction decrease to 10%.								
10	Taction decrease to 10%.								
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	18ft: Clay fraction increase to 20%, moist to v	.		-					
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20	20ft: Bedrock: Limestone.			[
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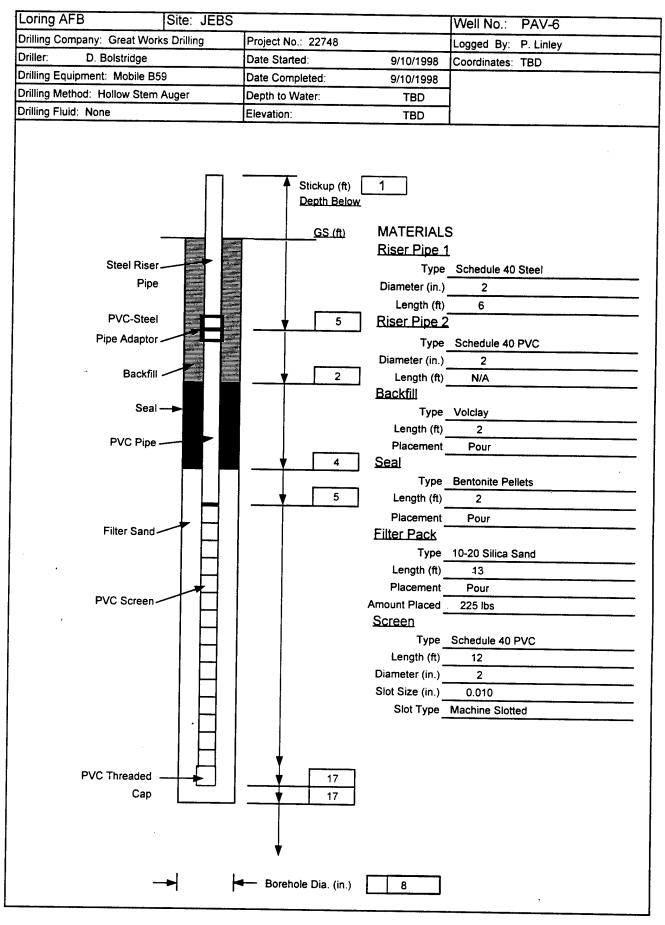
Projec	et Name: Loring AFB	T			Borehole No.: PAV-4
	Project Number: 22784 Elevation: TBD				
Locati	on: JEBS			31/98	Date Completed: 8/31/98
Driller:	: Great Works Drilling		epth (ft).		13
Equip	ment: Mobile B59		o Bedro		
Drilling	g Method: Hollow Stem Auger	Hole Di	iameter	(in):	8
	g Fluid: None	Depth t	o Water	(ft):	8
Comp	letion: Completed as a Passive Air Vent	Loggeo	By: P.	Linley	
	See Construction Log for details				
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
_	0-13ft: Gravelly Clayey Silt: (ML), Lt olive gry				No samples required for
_	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid_				collection.
	poorly sorted, subang to subrd, grl to 3-4 inches				
5-	in diameter.				
°-	Cft. V maint and blamma				
i -	6ft:V moist, cobble zone.				
-	8ft: Wet - Soupy, septic oder.				
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_	13ft: Bedrock: Limestone.				
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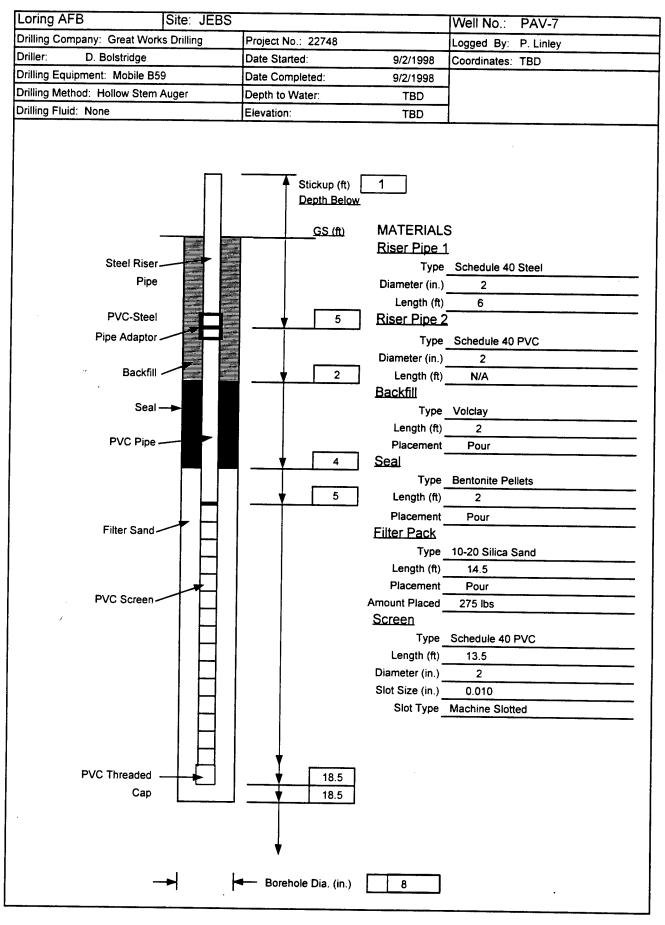
Project Number: 22784 Elevation: TBD Location: JEBS Date Started: 9/1/88 Date Completed: 9/1/98 Diffler: Great Works Drilling Total Depth (ft): 17.5 Equipment: Mobile 859 Depth to Bedrook (ft): 17.5 Drilling Method: Hollow Stem Auger Hole Diameter (in): 8 Drilling Method: Hollow Stem Auger Depth to Water (ft): 7BD Completion: Completed as a Passive Air Vent See Construction Log for details Description Description O-0.5ft: Concrete 0.5-1ft: Fill 1-17.5ft: Gravelly Clayey Silt: (ML), Lt olive gry (SY61/1) to loive gry (SY41/1), v fine to fine, unconsid poorly sorted, subang to subrd. The property of the property	Proie	ct Name: Loring AFB					
Date Started:9/1/98 Date Completed: 9/1/98	Broject Number 200704					Borehole No.: PAV-5	
Driller: Great Works Drilling Total Depth (ft): 17.5 Equipment: Mobile B59 Depth to Bedrock (ft): 17.5 Drilling Method: Hollow Stem Auger Hole Diameter (ft): 8 Drilling Fluid: None Depth to Water (ft): 7BD Completion: Completed as a Passive Air Vent See Construction Log for details							
Equipment: Mobile B59 Depth to Bedrock (ft): 17.5							
Drilling Method: Hollow Stem Auger						17.5	
Description Description Depth to Water (ft): TBD							
Completion: Completed as a Passive Air Vent See Construction Log for details Description Descr	Drillin	a Fluid: None					
See Construction Log for details Page Description D						TBD	
Description Descr	1001116	See Construction Lon for data the	Logged	d By: P.	Linley		
0-0.5ft: Concrete 0.5-1ft: Fill 1-1-7.5ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd. 10 17.5ft: Bedrock: Limestone.		See Construction Log for details					
0-0.5ft: Concrete 0.5-1ft: Fill 1-1-7.5ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd. 10 17.5ft: Bedrock: Limestone.				,			
0-0.5ft: Concrete 0.5-1ft: Fill 1-1-7.5ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd. 10 17.5ft: Bedrock: Limestone.	æ				Ĭ		
0-0.5ft: Concrete 0.5-1ft: Fill 1-1-7.5ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd. 10 17.5ft: Bedrock: Limestone.		Description	e e	υ	Ŋ		
0-0.5ft: Concrete 0.5-1ft: Fill 1-1-7.5ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd. 10 17.5ft: Bedrock: Limestone.	b to	1	dr dr	E a	≥	Comments	
0-0.5ft: Concrete 0.5-1ft: Fill 1-1-7.5ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd. 10 17.5ft: Bedrock: Limestone.	ے ا		Sar	Z Sal	<u> 유</u>		
1-17.5ft: Gravelly Clayey Sitt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd. 10 17.5ft: Bedrock: Limestone.	1 _			02		No samples required for	
1-17.5ft: Gravelly Clayey Silt : (<i>ML</i>), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd. 10	_					collection	
10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	l _	1-17.5ft: Gravelly Clayey Silt: (ML), Lt olive gry		i		concettori.	
pooriy sorted, subang to subrd. 10	_	(5Y6/1) to olive gry $(5Y4/1)$, v fine to fine, unconsid					
10	5_	poorly sorted, subang to subrd.					
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20 17.5ft: Bedrock: Limestone.	10]		·	[
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Projec	et Name: Loring AFB	I			Rombolo No : DAV 6		
	et Number: 22784	Borehole No.: PAV-6 Elevation: TBD					
	on: JEBS	Date Started:9/10/98 Date Completed: 9/10/98					
Driller	: Great Works Drilling	Total Depth (ft): 17					
	ment: Mobile B59		to Bedro				
	g Method: Hollow Stem Auger		iameter		8		
	g Fluid: None		o Water				
	letion: Completed as a Passive Air Vent				TBD		
	See Construction Log for details	Logged	By: P.	Liriley	,		
	o so construction Log for details						
			<u> </u>	1 =			
€	_			Blow Count			
듣	Description	ple	음	Ŏ	Comments		
Depth (ft)		Sample Number	Sample Type	<u> </u>			
	0-1ft: Concrete	υZ	ιν ⊢	<u>B</u>			
-	1-2ft: Fill - Gravel				No samples required for		
] -	2-17ft: Gravelly Clayey Silt: (ML), Lt olive gry				collection.		
-	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				·		
5	poorly sorted, subang to subrd.						
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"-	17ft: Bedrock: Limestone.		[
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Proje	ct Name: Loring AFB	Borehole No.: PAV-7					
	ct Number: 22784	Elevation: TBD					
Location: JEBS			Date Started:9/2/98 Date Completed: 9/2/98				
	: Great Works Drilling	Total Depth (ft): 18.5					
	ment: Mobile B59	Depth t	to Bedro	ck (ft).	18.5		
	g Method: Hollow Stem Auger		iameter		8		
	g Fluid: None		o Water	<u> </u>	TBD		
Comp	eletion: Completed as a Passive Air Vent	Logged	By: P.	Linley			
	See Construction Log for details			r			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
10 115 20 25 25 30 30 3	0-0.25ft: Asphalt 0.25-0.75ft: Fill - Gravel 0.75-18.5ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid, poorly sorted, subang to subrd, moist.	S	S		No samples required for collection.		



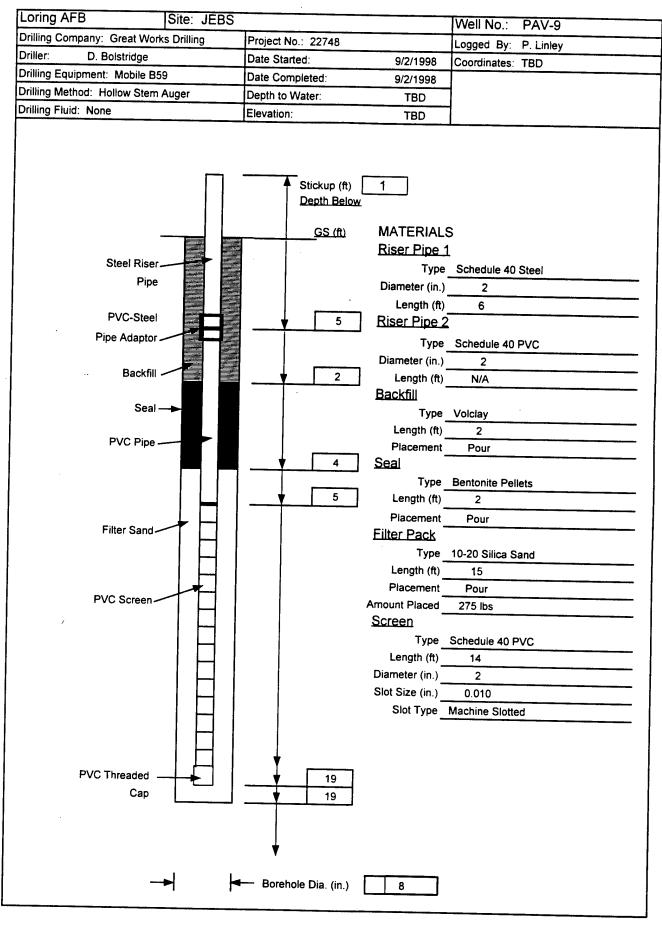
Projec	t Name: Loring AFB	<u> </u>		h	Borehole No.: PAV-8	
	t Number: 22784	Elevation: TBD				
Location	on: JEBS	Date S	tarted:9/	2/98	Date Completed: 9/2/98	
Driller:	Great Works Drilling	Total D	epth (ft):	•	17.5	
Equipr	nent: Mobile B59	Depth	to Bedro	ck (ft):	17.5	
Drilling	Method: Hollow Stem Auger	Hole D	iameter ((in):	8	
Drilling	Fluid: None	Depth	to Water	(ft):	TBD	
Compl	etion: Completed as a Passive Air Vent	Logged	By: P.	Linley		
	See Construction Log for details					
				텋		
Depth (ft)	Description	<u></u>	<u>o</u>	Blow Count	Comments	
l E	Description	E E	E 8	Š	Comments	
_ 		Sample Number	Sample Type	嚴		
	0-0.25ft: Asphalt				No samples required for	
	0.25-0.75ft: Fill - Gravel				collection.	
l _	0.75-17.5ft: Gravelly Clayey Silt: (ML), Lt olive					
_	gry (5Y6/1) to olive gry (5Y4/1), v fine to fine,]				
5_	unconsid, poorly sorted, subang to subrd.	_				
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 	7ft: moist.]				
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-	17.5ft: Bedrock: Limestone.	4				
-	17.5it. Bedrock: Limestone.	-				
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REQUEST FOR INFORMATION									
(RFI)									
PROJECT NAME: AFCEE - Loring									
JOB NO. 22784-006		RFI NO:	292						
LOCATION: Limestone, Maine		PAGE	1	OF _	1				
TO: John Mueller		OF: AFCE	E/ERB-L						
REFERENCE DRAWING: N/A	SPECIFIC	CATION:	N/A						
LOCATION: Jet Engine Buildup Sho	p SVE Syst	em							
seal. Well performance, as measured by vacuum compared to data recorded at startup and during measured during frozen ground conditions (natura surface seal) will indicate if a well is short-circuiti will be provided with a area specific surface seal. REASON REQUESTED: Cost savings by significantly redu REQUESTED BY: Eric Berglund	and after spal surface song to the su	oring thaw. D eal) and unfro urface. Wells	ifferences in we ozen ground co that indicate sh	ell performan nditions (no nort-circuiting					
REPLY REQUIRED BY: 9/15/98									
	ORMATIC ONTRACT	OT NO	BEI CONTRACTOR	<u> </u>					
TO: Eric Berglund	FROM:	John Muell	er						
OF: BEI	OF:	AFCEE							
REQUESTED INFORMATION: Approved per the attached email from AFBCA, De	enis St. Pet	er.	a. M	00					
<u>9-74-98</u> DATE	•	1/20	AFCEE/ERB-L						

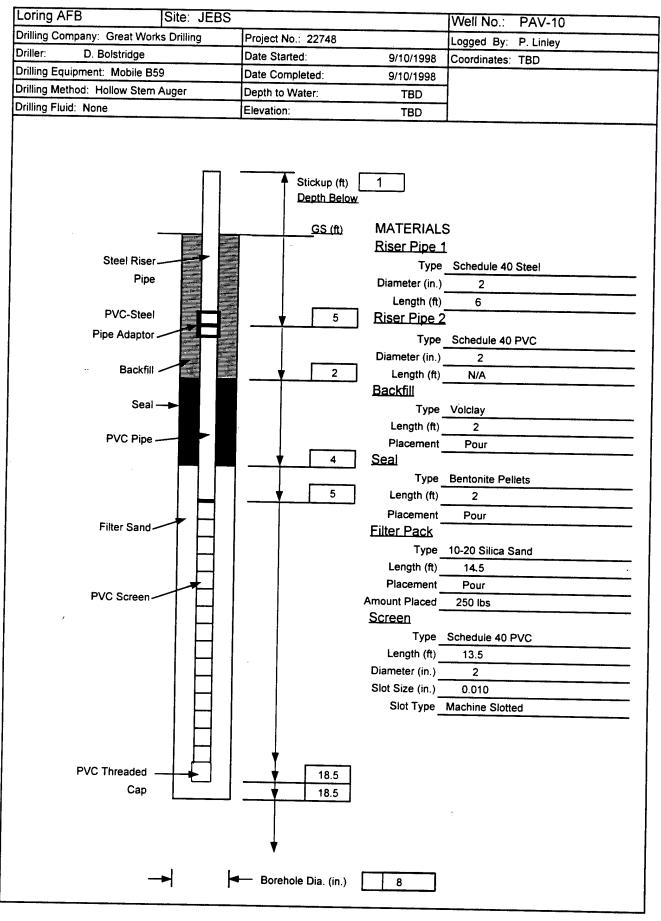
CC: Dorothy Allen, Byron Best, Ken Barry, Carl Dirnbauer, Ed Trujillo

Denis St. Peter

Proje	ct Name: Loring AFB	1			Borehole No.: PAV-9			
Project Number: 22784			on:	TBD	Derendie No.: 1 AV-5			
Location: JEBS			Date Started:9/2/98 Date Completed: 9/2/98					
	: Great Works Drilling	Total Depth (ft): 19						
	ment: Mobile B59	Depth	o Bedro	ck (ft).	19			
	g Method: Hollow Stem Auger	Hole D	iameter	(in):	8			
	g Fluid: None		o Water		TBD			
Comp	eletion: Completed as a Passive Air Vent	Logged	By: P.	Linley	Relocated approx. 1.5ft			
	See Construction Log for details		,	T	east of original location for rig access.			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments			
10	0-19ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd.	SS NI	Se Se Ty	18	No samples required for collection.			

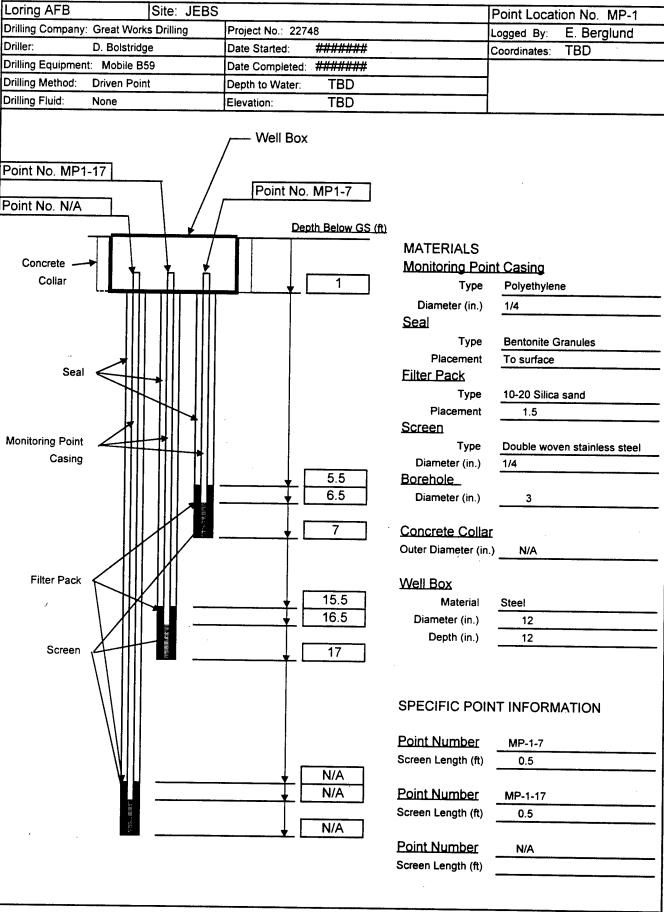


Projec	ct Name: Loring AFB				Borehole No.: PAV-10			
	ot Number: 22784	Elevation	on:	TBD				
	ion: JEBS				Date Completed: 9/10/98			
Driller	: Great Works Drilling	Total Depth (ft): 18.5						
	ment: Mobile B59		o Bedro					
Drilling	g Method: Hollow Stem Auger		iameter		8			
Drilling	g Fluid: None		o Water		TBD			
Completion: Completed as a Passive Air Vent		Logged By: P. Linley						
	See Construction Log for details		_					
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments			
10	0-18.5ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, moist.				No samples required for collection.			



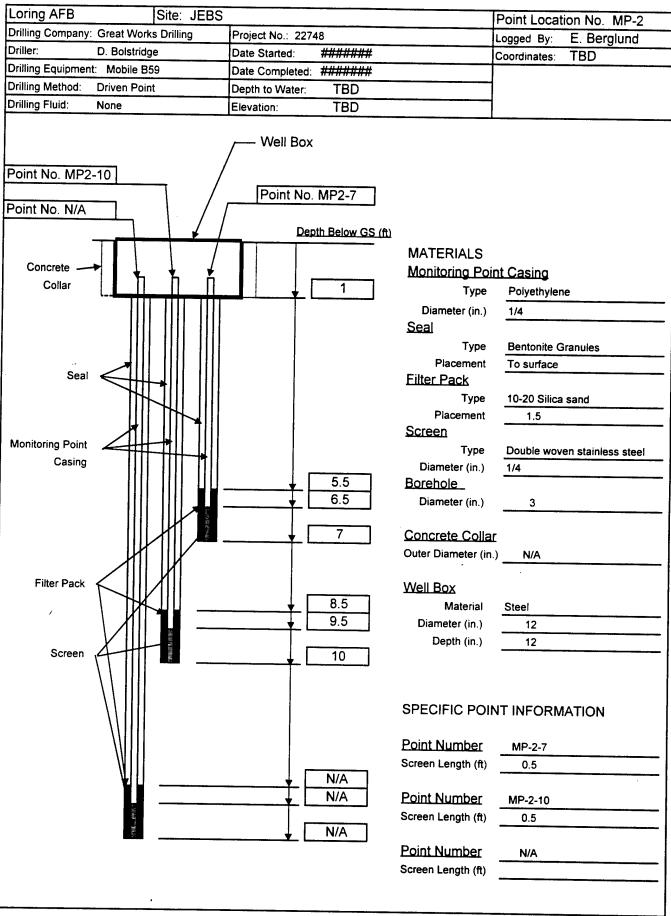
Projec	t Name: Loring AFB				Borehole No.: MP-1
Projec	t Number: 22784	Elevati	on:	TBD	DOTOTION TVO TVII - 1
	on: JEBS	Date S	tarted:9/		Date Completed: 9/11/98
Driller:	Great Works Drilling	Total D	epth (ft)	:	17
	ment: Mobile B59		o Bedro		
Drilling	Method: Hollow Stem Auger				3
	g Fluid: None		o Water		TBD
Compl	Completion: Completed as SVE Monitoring Point		Logged By: E. Berglund		
	See Construction Log for details			<u> </u>	
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
	0-17ft: Gravelly clayey silt: (ML), Lt olive gry				No samples required.
_	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				
-	poorly sorted, subang to subrd, moist.				
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SVE MONITORING POINT CONSTRUCTION LOG



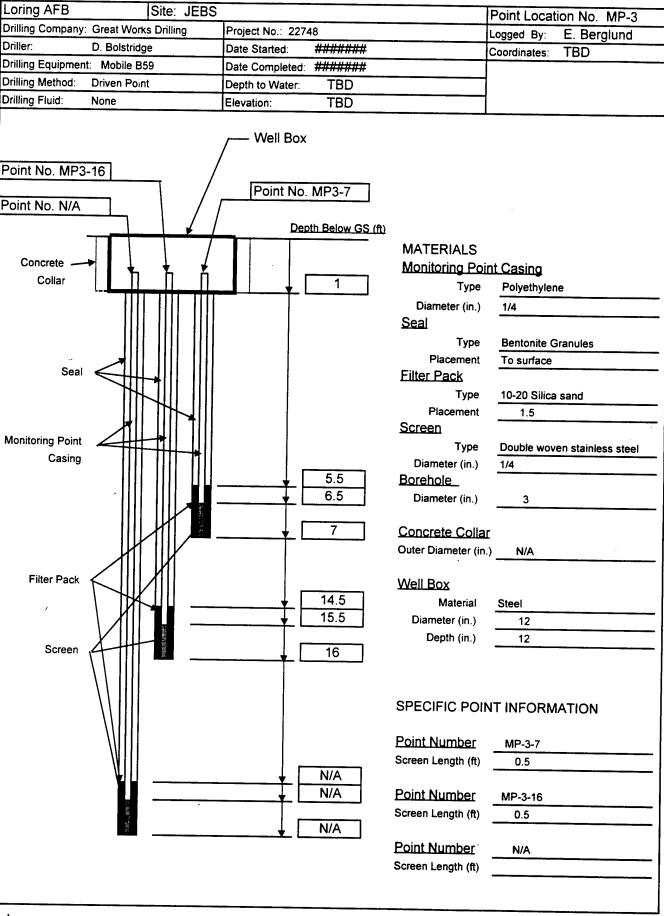
1	t Name: Loring AFB				Borehole No.: MP-2
	t Number: 22784	Elevati	on:	TBD	
	on: JEBS	Date Started:9/11/98 Date Completed: 9/11/98			
Driller:	Great Works Drilling	Total D	epth (ft)	:	10
Equip	ment: Mobile B59		o Bedro		
Drilling	Method: Hollow Stem Auger				3
Drilling	r Fluid: None				TBD
Compl	etion: Completed as SVE Monitoring Point		By: E.		
	See Construction Log for details		,	J	
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
_	0-10ft: Gravelly clayey silt: (ML), Lt olive gry				No samples required.
_	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld		}		, ,
_	poorly sorted, subang to subrd, moist.	;			
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SVE MONITORING POINT CONSTRUCTION LOG



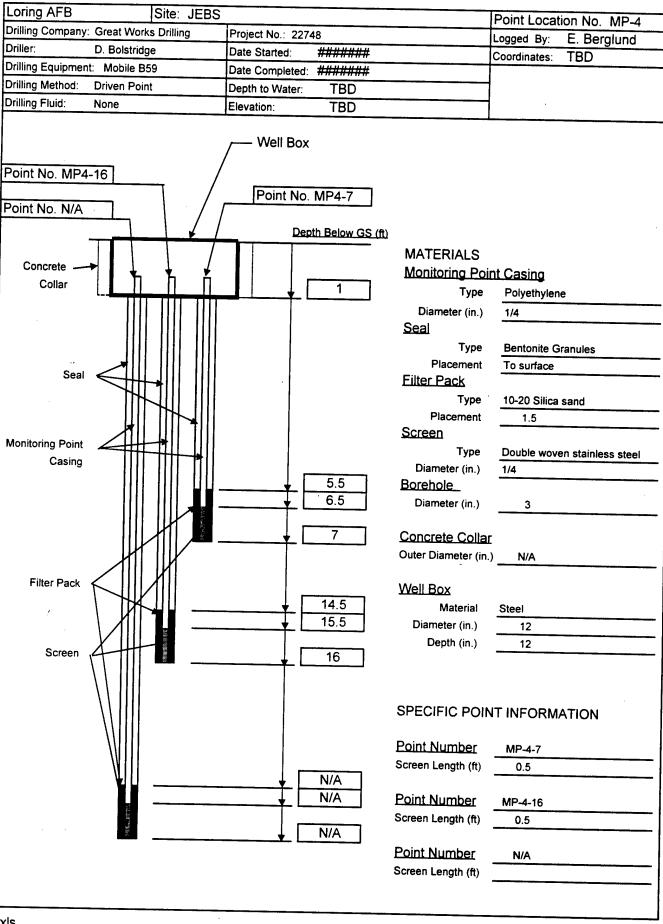
Proied	et Name: Loring AFB	T			Danibata N. M.D.O.	
	et Number: 22784	Borehole No.: MP-3 Elevation: TBD				
	on: JEBS					
	Great Works Drilling	Total F	larieu.9/	11/98	Date Completed: 9/11/98	
	ment: Mobile B59		epth (ft)		16	
	g Method: Hollow Stem Auger		to Bedro			
	g Fluid: None		iameter		3	
			to Water		TBD	
Completion: Completed as SVE Monitoring Point		Logged	By: E.	Bergli	und	
	See Construction Log for details		•			
			T .	T ==		
€			1	Blow Count		
£	Description	ple bei	용	ŭ	Comments	
Depth (ft)		Sample Number	Sample Type	<u></u>		
	0-16ft: Gravelly clayey silt: (ML), Lt olive gry	űΖ	ιχ Γ	8		
-	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				No samples required.	
-	poorly sorted, subang to subrd, moist.		į			
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SVE MONITORING POINT CONSTRUCTION LOG



Projec	t Name: Loring AFB		-		Borehole No.: MP-4
	t Number: 22784	Elevation	on:	TBD	
	on: JEBS	Date Started:9/11/98 Date Completed: 9/11/98			Date Completed: 9/11/98
Driller:	Great Works Drilling				16
Equipr	ment: Mobile B59				None
Drilling	Method: Hollow Stem Auger		iameter		3
	r Fluid: None		o Water		TBD
	etion: Completed as SVE Monitoring Point		By: E.		
	See Construction Log for details		,		
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
10 1 1 1 20 1 25 1	0-16ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, moist.				No samples required.
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SVE MONITORING POINT CONSTRUCTION LOG



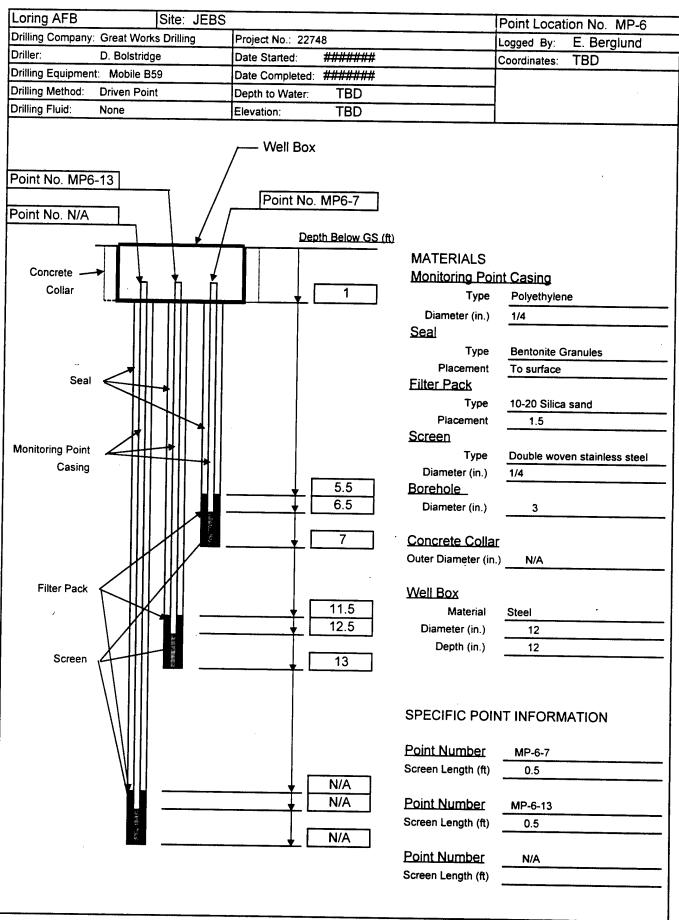
Projec	t Name: Loring AFB				Borehole No.: MP-5
	t Number: 22784	Elevati	on:	TBD	Dorenole IVO IVIF-3
	on: JEBS				Date Completed: 9/11/98
	Great Works Drilling	Total D	epth (ft)	:	18
Equipi	ment: Mobile B59		o Bedro		
Drilling	Method: Hollow Stem Auger		iameter		3
	Fluid: None		o Water		TBD
Compl	etion: Completed as SVE Monitoring Point	Logged	By: E.	Berali	
	See Construction Log for details		•	3	·
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
	0-18ft: Gravelly clayey silt: (<i>ML</i>), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, moist.				No samples required.
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SVE MONITORING POINT CONSTRUCTION LOG

Loring AFB	Site: JEBS			Point Location No. AAD 5
Drilling Company: Great Works		Project No.: 22748		Point Location No. MP-5 Logged By: E. Berglund
Driller: D. Bolstridg		Date Started: 9/11/1998		Coordinates: TBD
Drilling Equipment: Mobile B5		Date Completed: 9/11/1998		Coordinates. 18D
Drilling Method: Driven Point		Depth to Water: TBD		
Drilling Fluid: None		Elevation: TBD		
Point No. MP5-18 Point No. N/A Concrete Collar Seal Monitoring Point Casing Filter Pack Screen		Point No. MP5-7 Depth Below GS (ft) 1 1 16.5 17.5 18	MATERIALS Monitoring Poi Type Diameter (in.) Seal Type Placement Filter Pack Type Placement Screen Type Diameter (in.) Borehole Diameter (in.) Concrete Collar Outer Diameter (in.) Well Box Material Diameter (in.) Depth (in.)	Polyethylene 1/4 Bentonite Granules To surface 10-20 Silica sand 1.5 Double woven stainless steel 1/4 3
WIII		TAUA T	Screen Length (ft)	0.5
		N/A N/A	Point Number	MP-5-18
Hallitt on H		l Air	Screen Length (ft)	0.5
		↓ N/A	Point Number Screen Length (ft)	N/A
				•

	t Name: Loring AFB	T			Borehole No.: MP-6
	t Number: 22784	Elevation: TBD			
	on: JEBS	Date Started:9/11/98 Date Completed: 9/11/98			Date Completed: 9/11/98
	Great Works Drilling	Total D	epth (ft)		13
	ment: Mobile B59	Depth to Bedrock (ft): None			: None
Drilling	n Method: Hollow Stem Auger	Hole D	iameter	(in):	3
	r Fluid: None	Depth t	o Water	(ft):	TBD
Compl	etion: Completed as SVE Monitoring Point	Logged	I By: E.	Bergli	und ·
	See Construction Log for details				
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
10 1 15 1 20 1 30 1 30 1	0-13ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, moist.	S) Z	S	-	No samples required.
_					

SVE MONITORING POINT CONSTRUCTION LOG



APPENDIX C SVE EQUIPMENT INSPECTION

2190

Ext.



Copies to

Interoffice Memorandum

Distribution

Subject

SVE Equipment Inspection - Air Components

Date

October 19, 1998

From

David Wagner

Of

AFCEE

A site visit was conducted at Air Components (Grand Rapids, MI) to inspect the soil vapor extraction skid that will be installed at Loring Air Force Base. Del Stambach, of Air Components, was the contact that provided the inspection tour. The following is a summary of the visit/equipment inspection:

At

- 1. The equipment was checked against the design figures and equipment cut sheets that had been previously provided as submittals. The equipment layout and material correlated to the information provided.
- 2. The Erdco flowmeter was found to be absent on the skid. The expected shipping date for this item is November 4, 1998. The skid can be operated without this item.
- 3. The equipment was operated to check for excessive noise/vibration, etc., and was found to operate satisfactorily.
- 4. The system vacuum was observed to be 0.5 psig with no resistance on the blower.
- 5. The system was tested at 12-in Hg and the motor amperage was observed to be 72 amps.
- 6. The level switches in the air/water separator were tested to ensure transfer pump operation. The switches and transfer pump operated as designed.
- 7. The control panel was visually inspected and found to be of professional construction.
- 8. The 250-gallon water storage tank was inspected and found to be a in vertical configuration. The tank is approximately 8-ft high, with a loading hook attached at the top.

In general, the equipment was found to be professionally designed and of quality construction. The only outstanding equipment issue is the lack of the Erdco flowmeters. The equipment is still operational without these items, and it is my recommendation that the equipment be shipped to the Loring site as soon as possible. The vendor thought that shipment on October 19-20 was a reasonable date.

APPENDIX D REQUEST FOR INFORMATION No. 292

REQUEST FOR INFORMATION (RFI)							
PROJECT NAME: AFCEE - Loring							
JOB NO. 22784-006		RFI NO:	292				
LOCATION: Limestone, Maine		PAGE	1	OF .	1		
TO: John Mueller		OF: AF	CEE/ERB-L				
REFERENCE DRAWING: N	I/A S	SPECIFICATION:	N/A				
LOCATION: Jet Engine Bu	ildup Shop S	SVE System					
determined if necessary to do so. F seal. Well performance, as measured compared to data recorded at startup a measured during frozen ground conditi surface seal) will indicate if a well is shwill be provided with a area specific sur REASON REQUESTED: Cost savings by significations.	by vacuum a and during an ons (natural nort-circuiting face seal.	nd after spring thaw. surface seal) and ur g to the surface. We	rded during this published Differences in was in warrozen ground could be that indicate s	period and rell performar pnditions (no hort-circuiting	nce		
REQUESTED BY: Eric Berglund		-					
REPLY REQUIRED BY: 9/15/98				·			
9-Sep-98 DATE			BEI CONTRACTO	R			
, '		RMATION TO NTRACTOR					
TO:	F	FROM:					
OF:	C	OF:					
REQUESTED INFORMATION:	•						
DATE			AFCEE/ERB-				

CC: Dorothy Allen, Byron Best, Ken Barry, Carl Dimbauer, Ed Trujillo

Denis St. Peter

Dub, Andrea

From:

dpeter@afbda1.hq.af.mil

Sent:

Wednesday, September 09, 1998 4:13 PM

To:

aadub@bechtel.com; John.Mueller@hgafcee.brooks.af.mil

Cc:

cadirnba@bechtel.com; extrujil@bechtel.com

Subject:

re: Open RFI's

Thanks for the reminder. I agree with the following RFIs:

RFI 288 - Approval to proceed excavating/stockpiling barrier soil from misc areas for use on Landfill 3

RFI 289 - Approval to mix tub grinder by products and place in LF 3 per sediment placement plan

RFI 290 - Approval for revised area of excavation FTF, Bldg 8710 and

VMB

RFI 292 - Approval to not install surface seal at JEBS

Original Text

From: "Dub, Andrea" <aadub@bechtel.com>, on 9/9/98 1:12 PM:

To: Denis St Peter@Loring@AFBDA.OLM

Denis, I think the RFI's listed below may belong to you. Could you advise as to the status and if they are not in your area, please advise as to whom I should contact. thank you - Andrea

RFI 288 - Approval to proceed excavating/stockpiling barrier soil

from misc areas for use on Landfill 3

RFI 289 - Approval to mix tub grinder by products and place in LF 3 per sediment placement plan

RFI 290 - Approval for revised area of excavation FTF, Bldg 8710 and

VMB

RFI 292 - Approval to not install surface seal at JEBS

REQUES1		IFORMATI	ON		
	(RFI)				
PROJECT NAME: AFCEE - Loring					
JOB NO. 22784-006		RFI NO:	292		
LOCATION: Limestone, Maine		PAGE	1	OF	1
TO: John Mueller		OF: AFCE	E/ERB-L		
REFERENCE DRAWING: N/A	SPECIFIC	CATION:	N/A		
LOCATION: Jet Engine Buildup Sho	p SVE Syst	em			
seal. Well performance, as measured by vacuum compared to data recorded at startup and during measured during frozen ground conditions (natur surface seal) will indicate if a well is short-circuiti will be provided with a area specific surface seal. REASON REQUESTED: Cost savings by significantly redu REQUESTED BY: Eric Berglund REPLY REQUIRED BY: 9/15/98	and after span and af	oring thaw. Di leal) and unfro urface. Wells t	fferences in w zen ground co that indicate s	ell performar onditions (no hort-circuiting	
9-Sep-98			BEI		
DATE	ORMATIC		CONTRACTO	R	
	CONTRAC				
TO: Eric Berglund	FROM:	John Muelle	er		
OF: BEI	OF:	AFCEE			
REQUESTED INFORMATION: Approved per the attached email from AFBCA, De	enis St. Pet	er.			
<u> </u>		وف	AFCEE/ERB-I		_

CC: Dorothy Allen, Byron Best, Ken Barry, Carl Dirnbauer, Ed Trujillo

Denis St. Peter